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LITERATURE REVIEW

Methadone Maintenance Treatment

Canada

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Literature Review
Methadone Maintenance Treatment

Office of Canada's Drug Strategy
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Part 1: Introduction

Methadone maintenance treatment (MMT) was first introduced as a means of treating heroin withdrawal symptoms in opioid dependent persons almost forty years ago. Today, in many parts of the world, MMT is widely recognized as a key component of a comprehensive treatment and prevention strategy to address opioid dependence.[1] At the time of this review, methadone is the only opioid authorized for long-term outpatient pharmacological treatment of opioid dependence in Canada.

In Canada, as in many other countries, there is a national level regulatory framework for methadone prescription. The Office of Controlled Substances, Health Canada, works with provincial/territorial governments and medical licensing bodies to facilitate increased access to methadone maintenance treatment. To date, several provinces have developed – or are in the process of developing – guidelines and training for practitioners interested in providing methadone maintenance treatment. Although provinces have become increasingly involved in delineating the conditions under which physicians are permitted to prescribe methadone, methadone can be prescribed only by physicians who have received an exemption under the *Controlled Drugs and Substances Act*.

Health Canada, in collaboration with the provinces and territories, is involved in efforts to increase access to effective methadone maintenance programs.[2] Part of these efforts includes the production of two reports: this literature review to examine what is known about the effectiveness of methadone maintenance

1 The documents reviewed for this report primarily focussed on injection of opioids – primarily heroin injecting. Some clients/patients who receive methadone maintenance treatment are dependent on opioids that are taken in other forms, e.g. opioids such as morphine or Dilaudid® (hydromorphone) which are taken orally. Others may smoke or snort heroin. Although no estimate of the number of people who are dependent on opioids administered through non-injection routes was identified for this review, there is some information available regarding prescription opioid use: the 1996-97 National Population Health Survey found that 4.7% of Canadians aged 15 years or older reported using an opioid analgesic (codeine, Demerol ®or morphine) in the month preceding the survey (Canadian Centre on Substance Abuse & Centre for Addiction and Mental Health, 1999, 117). Methadone itself is a long-acting synthetic opioid agonist, which is prescribed as a treatment for opioid dependence. Methadone maintenance treatment is an appropriate form of treatment for opioid dependence, regardless of the route of administration (oral or injection).

2 For purposes of this document, a methadone maintenance treatment "program" encompasses the full continuum of treatment delivery modes and communities – from physicians in private practice who prescribe methadone to patients, to multi-service centres that provide a range of services and supports including methadone maintenance treatment, other substance use treatment and rehabilitation services, mental health services and medical services.

treatment, and a document on "best practices" in the design and delivery of methadone maintenance treatment (Health Canada, 2002a). A brochure on methadone maintenance treatment (Health Canada, 2002b), which complements the two best practices documents has also been produced. All of these documents contribute to the ongoing process of knowledge development and education for policy makers and health and social services professionals responding to the issue of opioid dependence.[3]

The purpose of this literature review is to provide an overview of the evidence on the effectiveness of methadone maintenance treatment. It focuses on what is known about the overall effectiveness of MMT, as well as factors that influence the effectiveness of MMT, namely:

- individual and programmatic factors,
- program development and design,
- program policies, and
- program team and environment.

Published empirical evidence on the relevant factors in MMT programs that can improve effectiveness in relation to specific populations, conditions, and settings is thin. Current literature on the specific topics of MMT and multiple substance use, women, pregnancy, comorbid medical conditions, prevention and treatment of infection with hepatitis C virus (HCV) and human immunodeficiency virus (HIV), mental health disorders, and MMT in correctional settings have been included.

This literature review is not an exhaustive review of all MMT literature, nor does it provide all the "keys" to effective delivery. Research and evaluation to fill gaps in knowledge and to improve the effectiveness of MMT is an ongoing process.

Note
In developing this document, the Investigator Team referred to sources that are believed to be reliable. This document, however, is not intended to provide readers with sufficient information to prescribe or dispense methadone.

3 Due to the wide range of practitioners and sectors involved in delivering MMT in Canada, this document uses the term "client/patient" rather than either "client" or "patient".

1.1 Methodology

There is now almost forty years of accumulated research knowledge and treatment literature concerning MMT. This report relies, in large part, on comprehensive, state-of-the-art reviews of the literature that have been conducted by others. In particular, the texts edited by Ward, Mattick, and Hall (1998e), Strain and Stitzer (1999), and Lowinson, Payte, Salsitz, Joseph, Marion, and Dole (1997) have been particularly valuable. These reviews offer thorough, up-to-date reviews of current literature and practice in methadone maintenance treatment, and provide an efficient way of dealing with the huge volume of methadone maintenance treatment studies published in recent years. Although not all of the extensive numbers of primary sources cited by these texts are mentioned in this report, readers are encouraged to consult these materials.

Relevant Canadian and international literature was identified in two ways: 1) by conducting key word searches of data bases, and 2) by contacting selected experts to identify additional published or unpublished resources.

The list of databases and search terms used included:

ISI's Current Contents - Life and Social and Behavioral. Past 6 months: Subject/ Keyword Methadone Maintenance. For current literature.

- *Addiction Research Foundation Library Catalogue* (now a part of the Centre for Addiction and Mental Health) Subject/Keyword: Methadone Maintenance - Manuals. For practice guidelines.

- *MEDLINE* (Database of the National Library of Medicine, National Institutes of Health, U.S.). Several comprehensive searches, 1994 to present, limited to human, English and French. Subject/Keywords: (Methadone or Methadyl Acetate) - Therapeutic Use or Administration and Dosage combined with Methadone Maintenance in keyword or Opioid-Related Disorders (exploded) - Rehabilitation or Drug Therapy. General Search Topics: Cost Effectiveness, Administration and Dosage, Other Diseases (HIV etc.), Other Drug Use, Dual Diagnosis, Needle Exchange, Treatment Outcome, Practice Guidelines, Health Care Delivery, Accessibility, Target Populations, Drug Diversion, Mandated Treatment.

- *EMBASE* (Excerpta Medica) (Elsevier Science Publishers, Netherlands). Searched 1994-present. Due to overlap with MEDLINE, searched only under terms: Evidence-Based Medicine or Practice Guidelines with Methadone in Subject heading and Methadone Maintenance in keyword.

- *CINAHL* (Nursing and Allied Health).General Search: Methadone Maintenance, 1994-present.

- *HealthSTAR* (American Hospital Assoc. and National Library of Medicine. Same search terms as MEDLINE general search, 1994-. Limited to non-MEDLINE records.

- *Web Sites:* CCSADOCS (Database of the National Clearinghouse on Substance abuse) [www.ccsa.ca], CANBASE (Database of the Canadian Substance Abuse Information Network), NIDA (National Institute on Drug Abuse, U.S.) [www.nida.nih.gov]; CSAT (Centre for Substance Abuse Treatment); U.S; National Guideline Clearinghouse (U.S.) [www.guidelines.gov] (Agency for Health Care Policy Research, American Medical Assoc. and American Association of Health Plans); ISDD (Britain), Australian Department of Health and Aged Care.

The Canadian HIV/ AIDS Clearinghouse also conducted a search of their collection for material on methadone maintenance treatment and HIV prevention.

The Investigator Team identified a vast body of literature published between 1995 and 2000, and reviewed over 300 documents for possible inclusion in the literature review. The final selection included key state-of-the-art reviews, key current reports from international and national agencies and organizations, articles presenting scientific evidence and studies or descriptions of some standard clinical practices authored by well-recognized experts in the field and published in well-recognized peer-reviewed journals or texts.

Part 2: Effectiveness of MMT

2.1 Evidence of Effectiveness

There is strong consensus about the overall effectiveness of MMT. In their review of the evidence, Hall, Ward, and Mattick (1998b, 50) conclude that "taken as a whole, the evidence provides good reason for believing that methadone maintenance is an effective form of treatment for opioid dependence *on average*".[4] MMT is also considered effective on a broad scale: "The treatment's effectiveness is evident among opiate-dependent individuals across a variety of contexts, cultural and ethnic groups, and study designs" (Marsch, 1998, Abstract). According to the National Consensus Development Panel on Effective Medical Treatment of Opiate Addiction as cited in Leshner (1999), methadone treatment is the drug abuse treatment modality that has been most rigorously evaluated and it has been found to be highly effective in retaining a large proportion of clients/patients in treatment by reducing intravenous drug use, human immunodeficiency virus (HIV) rates, criminal activity, and by enhancing their social productivity. The most effective programs are those that provide methadone as well as a range of medical, behavioural and social services.

The availability of evidence demonstrating MMT's effectiveness in achieving specific outcomes depends on the extent to which a particular outcome or goal has been studied. To date, treatment goals or outcomes that are of highest concern to society and communities, such as reductions in drug use or crime, have been more extensively researched than the goals that may be priorities for individuals who are dependent on opioids, such as preventing the transmission of HIV or improving their health and social well-being (Hall, Ward, and Mattick, 1998a, 3).

Table 1 provides an overview of some of the available information about the effectiveness of MMT, as assessed by several key reviews and articles.[5] The information contained in Table 1 strongly suggests that, there is a need for further research concerning MMT and treatment outcomes. This is exemplified by conflicting results reported in some of the studies reviewed. Also, given that there

4 Hall et al. (1998b, 50-51) explains that the phrase "on average" refers to the fact that there are important caveats concerning methadone's effectiveness in reducing illicit opioid use, reducing involvement in crime and improving health and social well-being of individuals receiving treatment. The caveats include, for example, the fact that methadone is not a cure for heroin dependence; methadone produces outcomes that are better than what would happen if methadone was not provided; methadone programs vary widely in their policies and effectiveness and this is linked to a number of different factors; the most effective programs resemble the Dole and Nyswander model in which higher doses of methadone are provided within a comprehensive treatment program with a maintenance rather than abstinence orientation; and the benefits of methadone continue only as long as individuals continue to receive treatment.

may be significant differences, in terms of treatment goals, at the societal, individual, and program/clinical level, the list of potential treatment goals in Table 1 is not exhaustive – clients/patients, in particular, may have varied reasons for entering or remaining in treatment. In addition, many treatment goals are inter-related, e.g., the goal of retaining people in treatment is linked to the goal of achieving other outcomes, such as a more stable lifestyle and other positive treatment outcomes.

2.1.1 Effectiveness of MMT Compared to No Treatment

MMT – even with minimal or no counselling – has been shown in five randomized trials to be much more effective than no treatment (Gunne & Grönbladh; Yancovitz et al.; Dole et al.; Vanichseni et al.; Newman & Whitehill, as cited in Brands & Brands, 1998, 2). According to Hall et al. (1998b, 21-25, 51), the three controlled trials of comprehensive methadone maintenance over a substantial period of time conducted by Dole et al., Newman and Whitehill, and Gunne and Grönbladh all showed that methadone maintenance was more effective than either placebo or no treatment in retaining people in treatment, in reducing opioid use, and in reducing the rate of imprisonment.

2.1.2 Effectiveness of MMT Compared to Other Types of Treatment for Opioid Dependence[6]

In the work by Simpson on the Drug Abuse Reporting Program study (as cited in Brands & Brands, 1998, 2), the researchers found that MMT of at least three months' duration is superior to detoxification or assessment alone, but no clear cut superiority was demonstrated for MMT over outpatient counselling or therapeutic communities. Subsequent research by Hubbard et al. on the Treatment Outcome Prospective Study (as cited in Brands & Brands, 1998, 2) demonstrated that, in terms of achieving higher retention rates, MMT has substantially higher rates compared to outpatient counselling without methadone or residential programs without methadone.

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5 Many of the sources used for this section of the report cite researchers who have worked with data from one or more of the three major studies of drug abuse treatment: the Drug Abuse Reporting Program (DARP), 1969-1972; the Treatment Outcome Prospective Study (TOPS), 1979-1981; and the Drug Abuse Treatment Outcome Studies (DATOS), 1991-1993.

6 Please note: a detailed review of the effectiveness of MMT compared to other opioid replacement therapies is beyond the scope of this literature review.

Table 1
Methadone Maintenance Treatment and Treatment Outcomes

Treatment Goal	Evidence of Treatment Outcomes
Reduced Drug Use	Reduced Use of Illicit Opioids/Heroin • Many studies conducted over a period of several decades in different countries have demonstrated clearly that MMT results in markedly decreased illicit opioid use (National Consensus Development Panel on Effective Medical Treatment of Opiate Addiction, 1998, 1939). • According to their review of the evidence, Hall et al. (1998b, 53) conclude that there is "strong evidence that there are substantial reductions in heroin use while [people who are dependent on opioids] are enrolled in methadone maintenance." • Based on its review of the evidence, the National Institute on Drug Abuse (National Institute on Drug Abuse, 1995, 1-7) found that during MMT, clients'/patients' use of illicit opioids declines, sometimes "dramatically", but this requires adequate methadone dosage levels. • MMT has moderate effect in reducing illicit opioid use (Marsch, 1998, Abstract). • Based on their review of the evidence, Hall et al. (1998b, 53) conclude that "a number of caveats have to be entered to avoid unrealistic expectations of methadone maintenance treatment. First, methadone maintenance does not produce abstinence from all illicit opioids in all patients; nevertheless, it produces a substantial reduction in rates of heroin use and abstinence from illicit opioids in approximately half of those who receive it. Second, different programs differ in their effectiveness. Third, the best supported model of treatment is that developed by Dole and Nyswander, namely, opioid maintenance treatment. Fourth, accordingly, the benefits of methadone treatment continue only as long as clients/patients remain in treatment." • Although achieving a sustained drug-free state is an "optimal treatment goal," the evidence indicates that this goal cannot be achieved by most individuals who are dependent on opioids (National Consensus Panel on Effective Medical Treatment of Opiate Addiction, 1998, 1937). • Based on an extensive review of the results of 11 randomized controlled trials and several observational studies, Ward, Mattick and Hall. (1998h, 217-222) indicate that there is a clear dose-response relationship between methadone dose and heroin use. The likelihood that clients/patients will use heroin decreases as the methadone dose increases.

Table 1
Methadone Maintenance Treatment and Treatment Outcomes (continued)

Treatment Goal	Evidence of Treatment Outcomes
	Reduced Use of Other Drugs • MMT programs "significantly and consistently" reduce the use of illicit opioids as well as the use of other illicit drugs, including cocaine and marijuana. MMT programs also reduce the abuse of alcohol, benzodiazepines, barbiturates, and amphetamines (National Consensus Development Panel on Effective Medical Treatment of Opiate Addiction, 1998, 1939). • Consistent with numerous previous evaluations of MMT, the Drug Abuse Treatment Outcome Studies (DATOS) found that MMT is effective in reducing illicit use of cocaine and other drugs (Fletcher & Battjes, 1999, 85). • Based on its review of the evidence, the National Institute on Drug Abuse concluded that, research findings are "mixed" with regard to MMT's effect on the use of illicit drugs other than opioids. While some research indicates that MMT is associated with decreases in the use of alcohol, cocaine and marijuana, other research indicates increases in the use of these drugs. Although MMT does not have – is not intended to have – an effect on alcohol and other drug use, when the biopsychosocial treatment services included in MMT are "specifically designed to reduce alcohol and drug use, such reductions are likely." (National Institute on Drug Abuse, 1995, 4-15). • Although methadone has no direct pharmacological effect on non-opioid drugs, when people who are dependent on opioids enter MMT their use of other drugs often declines (Lindesmith, 1997, 1).
Reduced criminal activity	• Over the past twenty years, the evidence from multiple studies has been "clear and convincing" in demonstrating that effective treatment of opioid dependence markedly reduces rates of criminal activity (National Consensus Development Panel on Effective Medical Treatment of Opiate Addiction, 1998, 1939). • Consistent with numerous previous evaluations of MMT, the Drug Abuse Treatment Outcome Studies (DATOS) found that MMT is effective in reducing the incidence of drug-related criminal behaviour (Fletcher & Battjes, 1999, 85). • Based on their review of the evidence, Hall et al. (1998b, 53) conclude that there is "strong evidence that there are substantial reductions in crime while [people who are dependent on opioids] are enrolled in methadone maintenance."

Table 1
Methadone Maintenance Treatment and Treatment Outcomes (continued)

Treatment Goal	Evidence of Treatment Outcomes
	• The effectiveness of MMT is most apparent in its ability to reduce drug-related criminal behaviours (Marsch,1998, Abstract). • McGlothin and Anglin (as cited in National Institute on Drug Abuse, 1995, 4-8) found that MMT is associated with less time dealing drugs, less time involved in crime, and less time being arrested and incarcerated. • MMT is associated with less time being arrested and incarcerated (National Institute on Drug Abuse, 1995, 4-8). • Retention in treatment was found to have only a slight, but significant, effect on reducing criminal activity during treatment. More research is needed on "the dynamics of MMT in the 1990s and the relationship between crime and treatment" (Rothbard, Alterman, Rutherford, Liu, Zelinski, and McKay, 1999, 335).
Reduced mortality	• Studies have shown that death rates among individuals receiving methadone are lower than among those who are dependent on opioids and not receiving methadone treatment – the death rate for those not receiving treatment is more than three times higher than for those engaged in treatment (National Consensus Development Panel on Effective Medical Treatment of Opiate Addiction, 1998, 1938).
Improved physical and mental health	• Consistent with numerous previous evaluations of MMT, the Drug Abuse Treatment Outcome Studies (DATOS) found that MMT is effective in supporting improvement in "several domains of health, mental health, and social function" (Fletcher & Battjes, 1999, 85). • "Following entry into MMT, health status usually improves with access to medical care, elimination of injections with contaminated needles, and improved quality of life " (Lowinson et al., 1997, 409). • Dole, Nyswander and Kreek (as cited in National Institute on Drug Abuse, 1995, 4-9) found that methadone maintenance treatment can stabilize the mood and functional state of clients/patients. • Walsh and Strain (199, 50) note that there is "some evidence....that mehtadone and opioids in general can have anti-anxiety, antidepressant and anti-psychotic effects." They also point out, however, that controlled studies of the use of methadone for anxiety, depression or psychosis have not been done.

Table 1
Methadone Maintenance Treatment and Treatment Outcomes (continued)

Treatment Goal	Evidence of Treatment Outcomes
	• Best, Lehmann, Glossop, Harris, Noble, and Strung (1998, 1) note that more research is needed on the effectiveness of methadone maintenance treatment that takes wider lifestyle variables (high smoking levels, poor diet and infrequent eating, and drinking) into account.
Reduced risk behaviours for HIV, HCV and other blood-borne pathogens & reduced risk behaviours for HIV and other STDs (sexually transmitted diseases)	Reduced injection-related risk behaviours[7] • A review of several studies indicates that MMT is consistently associated with reductions in sharing of drug injecting equipment, which is the main risk factor for transmission of blood-borne viruses such as HIV, hepatitis B and hepatitis C, among injection drug users. MMT reduces injection-related risk behaviour among injection drug users, but it does so only while clients/patients remain in treatment, and when they are receiving adequate doses of methadone (Ward, Mattick et Hall, 1998g, 67-68). • Ball and Ross (as cited in National Institute on Drug Abuse, 1995, 4-22) found that 71% of clients/patients who remained in treatment for one year or more stopped injection drug use. • MMT has a small to moderate effect in reducing HIV risk behaviours (Marsch, 1998, Abstract). Reductions in other risk behaviours for HIV and other STDs • Women who are dependent on opioids often support their drug use through sexual behaviour such as prostitution or exchanging sex for drugs. Because treatment "lessens the economic need for such sexual activity", MMT may be a potentially effective intervention for reducing sexual risk behaviour among women who are dependent on opioids (Wells, Calsyn et Clark, 1996, 519). • MMT may help people who are dependent on opioids to reduce their risk of acquiring HIV through sex with multiple partners by reducing their involvement in sex work to support their drug habit and by increasing their "perceived self-efficacy for risk reduction" (Longshore, Hsieh et Anglin, 1994, 754).
Reduced rates of infection and transmission of HIV, HCV and other blood-borne pathogens	HIV • "Properly dosed, long-term methadone treatment was a central protective factor in preventing HIV infections from the earliest days of the epidemic in New York City "(Hartel & Schoenbaum, 1998, Abstract).

7 Injection drug use is associated with a high risk of transmission of HIV, HCV and other blood-borne pathogens.

Table 1
Methadone Maintenance Treatment and Treatment Outcomes (continued)

Treatment Goal	Evidence of Treatment Outcomes
	• Studies reviewed by Ward et al. (1998g, 64) show there is "reasonable support" to indicate that methadone maintenance protects clients/patients from HIV infection. • "Methadone may protect against HIV....time spent in methadone treatment was the major determinant of remaining HIV-free" (Serpelloni, Carrieri, Rezza, Morganti, Gomma et Binkin, 1994, 218). • Metzger et al.(as cited in National Institute on Drug Abuse, 1995, 4-19) found a lower rate of HIV infection among those receiving MMT (15%) compared to those who were dependent on opioids and not receiving treatment (33%). Those who remained out of treatment had a 22% increase in HIV seroconversion, compared to 3.5% for those in methadone maintenance treatment (in National Institute on Drug Abuse, 1995, 4-19, 4-20). HCV and other blood-borne pathogens • Dole, Joseph and Des Jarlais (as cited in National Institute on Drug Abuse, 1995, 4-23) found MMT was associated with reduced incidence of serum hepatitis. • Current research reviewed by Ward et al. (1998g, 68-69) indicates that MMT is unlikely to protect clients/patients against infection with hepatitis B or C where the population of injection drug users has a high prevalence of hepatitis B and C. This is because clients/patients will usually have been exposed to hepatitis B and/or C by the time they present for treatment). At this time, there is insufficient evidence to evaluate the extent to which MMT can prevent hepatitis B and/or C infection. • "The simple provision of methadone to [injection drug users] IDUs at risk of infection with or of transmitting HCV is not necessarily prophylactic against HCV transmission occurring." More assessment is needed to determine the role of MMT in prevention and control of transmission of HCV among IDUs (Crofts, Nigro, Oman, Stevenson et Sherman, 1997, 999). • "Injection drug users not infected with HCV, who enter a methadone program and do not use other drugs or alcohol, are very likely to remain HCV negative (Novick, 2000, 440)."

Table 1
Methadone Maintenance Treatment and Treatment Outcomes (continued)

Treatment Goal	Evidence of Treatment Outcomes
Improved social functioning and quality of life	Employment/Earnings/Social Productivity • Consistent with numerous previous evaluations of MMT, the Drug Abuse Treatment Outcome Studies (DATOS) found that MMT is effective in supporting improvement in "several domains of health, mental health, and social function" (Fletcher & Battjes, 1999, 85). • Long-term outcome data have shown that individuals who are dependent on opioids and who are in MMT earn more than twice as much money per year as those who are not in treatment (National Consensus Development Panel on Effective Medical Treatment of Opiate Addiction, 1998, 1939). • Simpson and Sells (as cited in National Institute on Drug Abuse, 1995, 4-18) found that MMT significantly increased the likelihood of being employed full-time. • Gearing and Schweitzer (as cited in Brands & Brands, 1998, 2) found that two years after admission to methadone maintenance treatment, the percentage of clients/patients who became socially productive (defined as employed, in school or "homemaker") rose from 36% to 76%. Quality of life • Quality of life improves in most domains after one year in MMT (Dazord, Mino, Page et Broers, 1998, Abstract).
Improved pregnancy outcomes	• Research has demonstrated that comprehensive MMT, combined with adequate prenatal care, decreases obstetrical and fetal complications (National Consensus Panel on Effective Medical Treatment of Opiate Addiction, 1998, 1939). • Preliminary data suggests that women who receive MMT are more likely to be treated with medication which reduces the rate of HIV transmission to their newborns (National Consensus Panel on Effective Medical Treatment of Opiate Addiction, 1998, 1939). • According to a review by Ward, Mattick and Hall (1998d, 412), for many women who are pregnant and who are dependent on opioids, there is clear evidence that MMT is less harmful than either continued heroin use or detoxification. • Based on the National Institute of Drug Abuse's review of the evidence, MMT reduces adverse pregnancy outcomes and reduces adverse birth outcomes (National Institute on Drug Abuse, 1995, 1-33).

Table 1
Methadone Maintenance Treatment and Treatment Outcomes (continued)

Treatment Goal	Evidence of Treatment Outcomes
	• "Methadone has been shown to be an effective treatment for pregnant women who are using opioids (Jarvis & Schnoll, 1994, 160)." • The work of Finnegan, Hagan and Kaltenbach, Silver et al., Kleber, and Woody et al. (as cited in Finnegan, 1991, 199) "show that when the physical, psychological, and sociological issues of pregnant opioid-dependent women and their children are coupled with MMT, the potential physical and behavioral effects of psychoactive drugs on the mother, the fetus, the newborn, and the child may be markedly reduced."
Retention in treatment	• Hubbard et al. (as cited in Brands & Brands, 1998, 2) found that MMT had substantially higher retention rates (68% after three months) compared to outpatient counselling without methadone (36%) or residential programs without methadone (45%). • Retention rate was highest in MMT after one year (40%) compared to naltrexone (18%) and drug-free program (15%) (D'Ippoliti, Davoli, Perucci, Pasqualini and Bargagli, 1998, 167).

2.2 Cost Effectiveness of MMT

The costs of opioid dependence – for individuals and for society – are staggering. Human, economic and societal costs of opioid dependence include increases in criminal acts and concomitant costs to the criminal justice system (a high proportion of inmates are incarcerated for drug offences); dramatic increases in the prevalence of HIV, hepatitis B and hepatitis C (HCV), and tuberculosis; increases in opioid-related emergency room visits, and opioid-related deaths (National Consensus Development Panel on Effective Medical Treatment of Opiate Addiction, 1998, 1937). According to their review of the literature, Hall et al. (1998b, 50) found that "failure to provide treatment carries a high risk of premature mortality and serious morbidity for users, and high social and economic costs for the community." In the United States, health care costs related to opioid dependence have been estimated to be $1.2 billion per year (National Consensus Development Panel on Effective Medical Treatment of Opiate Addiction, 1998, 1939). According to Single (1999, 57), illicit drug use costs $1.37 billion in Canada each year, and "much of the costs result from injection drug use." Single also notes that "the largest cause of drug-attributable deaths are suicide, overdose and AIDS contracted from sharing needles – all of which are strongly associated with injection drug use.

Meanwhile, research has shown that MMT:

- Yields a benefit/cost ratio of 4.4:1 compared to other treatment modalities (Rufener and colleagues, as cited in Lowinson et al., 1997, 412).
- Yields a benefit/cost ratio of 4:1 (Harwood et al., as cited in Lowinson et al., 1997, 412).
- Offers a cost-benefit of US $4-$13 for every $1 spent on methadone (Gerstein et al., as cited in Stoller and Bigelow, 1999, 25).
- Offers an estimated health care savings of US $1.325-$1.75 billion in U.S. if all opioid-dependent persons were participating in methadone maintenance treatment (resulting in a projected decrease of 55,000-70,000 in new HIV infections each year) (Stoller and Bigelow, 1999, 25)

With regard to cost outcomes, Stoller and Bigelow (1999, 26) provide the following list of cost factors and cost benefits of methadone treatment:

Table 2
Analysis of Costs and Benefits
(based on Stoller and Bigelow, 1999, 26, Table 2.4)

Cost Factors	Benefits
Staff wages and benefits	Reduced illicit drug consumption
Rent and utilities	Improved general health
Licensing and credentialing	Improved access to health care
Medical supplies	Reduced spread of infectious diseases
Staff training	Improved psychological well-being
Medication (methadone)	Reduced violence
Urinalysis	Reduced theft and property damage
Security	Acquired/maintained employment
Documentation and record keeping	Decreased reliance on public assistance
	Improved domestic relations
	Improved child rearing
	Improved social functioning

Part 3: Factors that Influence the Effectiveness of MMT

Despite the lack of consensus about how treatment should be delivered, there is a significant amount of information about individual and program factors that influence the effectiveness of methadone maintenance treatment programs – primarily in terms of client/patient retention in treatment.

3.1 Individual Factors

Individual circumstance or status may affect treatment outcomes either positively or negatively. As Lowinson et al. (1997, 412) note, however, many people in treatment have to contend with circumstances that create significant obstacles to success in treatment: "For the majority of inner-city patients, lack of education and job skills, child care, unemployment, and poverty continue to have an adverse impact on socially productive behaviour and treatment response."

Strain (1999b, 76) cautions that predicting outcomes in treatment can be difficult: "...no single characteristic or set of characteristics can fully predict those who will do well or poorly in treatment." Strain also notes that some client/patient characteristics and some early treatment results are associated with better outcomes (and refers to McLellan), but points out that this information should not be used to allocate treatment slots.

Based on his review of the evidence, Darke (1998b, 83-84) argues that many of the problem factors that tend to be associated with poorer prognoses can actually be improved by participation in treatment programs, particularly through "careful clinical management". For example, he cites the work of Caplehorn et al. and Grönbladh et al. which has shown that methadone maintenance treatment can significantly reduce the risk of morbidity and mortality related to injection drug use, and notes that psychiatric distress and drug use (including cocaine use) may also be reduced by participation in treatment. Furthermore, Darke concludes that the risk of diversion can be addressed by "cautious clinical judgement" in prescribing take-home doses.

According to evidence reviewed by Ward, Mattick and Hall (1998b, 331), programs should use information about problem characteristics among clients/patients to enhance their efforts to retain those people in treatment. In their view, "patients should not be encouraged to leave methadone maintenance before they show....signs of rehabilitation (i.e., employment, stable social adjustment, no illicit drug use, etc.)."

Table 3 provides some information about individual characteristics that have been linked to treatment outcomes.

Table 3
Individual Factors

Individual characteristic/factor	Associated Outcomes
Age	• Older age is the characteristic most consistently associated with better outcomes (McLellan and Farley et al., as cited in Strain, 1999b, 76).
Relationship-related factors	• Being married is associated with better outcomes (McLellan and Farley, et al., as cited in Strain, 1999b, 76). • Intact social support network is associated with success in methadone maintenance treatment (McLellan, Simpson and Sells, Ball and Ross and Anglin and Hser, as cited in National Institute on Drug Abuse, 1995, 1-45). • The evidence reviewed by Ward et al. (1998b, 330-331) suggests that clients/patients who have "reasonable social support" have a higher likelihood of success if they complete methadone maintenance treatment. Not living with a family or partner is one of the characteristics that makes a client/patient likely to relapse to drug use and/or criminal activity if they leave treatment.
Employment	• Poor employment history is associated with poor treatment retention (McLellan and Farley et al. as cited in Strain, 1999b, 76; National Institute on Drug Abuse, 1995). • Evidence reviewed by Ward et al.(1998b, 330) indicates those clients/patients who do not find employment before, during or after methadone maintenance are most likely to relapse to drug use and/or criminal activity if they leave treatment. Becoming employed is one of the factors associated with a better chance of success for clients/patients who complete treatment.
Mental health status	• Evidence reviewed by Darke (1998b, 82) indicates that psychological distress is common and may impede outcomes, but methadone maintenance treatment may "contribute to an amelioration of patients' symptoms of depression and anxiety." • Psychological problems are associated with poor treatment retention (McLellan and Farley et al., as cited in Strain, 1999b, 76).

Table 3
Individual Factors
(continued)

Individual characteristic/factor	Associated Outcomes
	• Evidence reviewed by Darke (as cited by Ward, Mattick and Hall, 1998f, 434) suggests that it is the "overall severity" of clients'/patients' psychiatric problems that is related to poorer treatment outcomes, rather than specific diagnoses.
Criminal history	• Those with minimal criminal involvement are likely to have better treatment outcomes (McLellan; Simpson & Sells; Ball & Ross; Anglin & Hser, as cited in National Institute on Drug Abuse, 1995, 1-45). • Evidence reviewed by Ward et al. (1998b, 331) indicates that one of the success factors for clients/patients who complete MMT is having "little history of criminal activity." Those clients/patients with a " longer and more extensive criminal history" are most likely to return to using drugs and/or criminal activity if they leave treatment. • A history of criminal activity is associated with poor treatment retention (McLellan and Farley et al., as cited in Strain, 1999b, 76).
Drug use	• Evidence reviewed by Ward et al. (1998b, 331) indicates that clients/patients with a "longer and heavier history of opioid use" are most likely to return to using drugs and/or engaging in criminal activity if they leave treatment. • According to evidence reviewed by Darke (1998b, 76) drug use other than heroin (e.g., benzodiazepine, cocaine) is associated with riskier behaviours and poorer psychological functioning and may indicate a poorer prognosis. • Amount of illicit opioid use during first two weeks of treatment is predictive of subsequent rates of opioid use (as measured by urine samples) (Strain et al, as cited in Strain, 1999b, 76). • Amount of cocaine use during first two weeks of treatment is predictive of subsequent rates of cocaine use (as measured by urine samples) (Strain et al., in Strain, 1999b, 76).
Behaviour	• According to evidence reviewed by Ward et al. (1998b, 331) clients/patients who leave treatment "against staff advice" or who exhibit "little behaviour change during treatment" are most likely to return to using drugs and/or engaging in criminal activity if they leave treatment.

Table 3
Individual Factors
(continued

Individual characteristic/factor	Associated Outcomes
Treatment readiness/ motivation	• Treatment readiness, "measured with items from the CMRS [circumstance, motivation, readiness and suitability] (De Leon & Jainchill, 1986; Joe, Simpson and Broome, 1998) was found to be significantly related to therapeutic involvement" (Fletcher & Battjes, 1999, 83). • Motivation at intake is a strong determinant of therapeutic involvement (Joe, Simpson and Broome, 1999, Abstract) • Patients expressing greater confidence and commitment after three months of treatment generally began with higher motivation at intake (Broome et al., 1999, Abstract).
Therapeutic involvement	• Therapeutic involvement – when "measured in terms of rapport with counsellor, confidence in treatment, and commitment to treatment" – was a significant predictor of retention (Fletcher & Battjes, 1999, 83). • Therapeutic involvement is strongly determined by motivation at intake (Joe et al., 1999, Abstract).

3.2 Program Factors

Some researchers have emphasized the importance of the manner in which treatment is provided. For example, Magura, Nwakeze and Demsky (1998a, 57) found evidence that events during treatment are critical factors for retention in treatment: In this study, "only two out of 16 pre-treatment variables (pre-treatment variables include individual characteristics), compared with five out of six during-treatment variables had significant effects on retention...."

A number of program characteristics or factors have been associated with improved treatment outcomes – primarily improvements in client/patient retention in treatment. The emphasis on retention in treatment is key because, according to studies reviewed by Ward et al. (1998b, 312), longer lengths of time spent in treatment are related positively to treatment outcomes.

Their introduction to the text edited by Ward, Mattick and Hall (1998a, 3) notes that the characteristics that appear to affect treatment outcome are: methadone dose, duration of treatment, and ancillary services. Based on their analysis of the evidence, Hall et al. (1998b, 51-52) note that, in fact, the most effective programs are those that most closely resemble the original Dole and Nyswander model and

offer: higher doses, and comprehensive treatment aimed at maintenance rather than abstinence. As they explain: "Analyses of the characteristics that predict the variations between programs in retention, drug use and criminality have generally supported the original model of Dole and Nyswander in showing that programs with higher doses, a maintenance goal and ancillary services have better outcomes than programs that use lower doses and aim to achieve abstinence."

Table 4 lists the program-related factors that have been associated with treatment outcomes (see also Part 4.0, Part 5.0 and Part 6.0) . These program factors also relate to the needs of specific groups (see also Part 7.0).

Table 4

Program-Related Factors	Associated Treatment Outcomes
Emphasis on retention	• Retention of clients/patients is necessary for any changes to occur. Consequently, retention is an accepted indicator of program functioning (Ward, Mattick and Hall, 1998h, 214). • Retention in treatment is a key factor in achieving positive treatment outcomes (see Section 4.1). • Consistent with numerous previous evaluations of MMT, the Drug Abuse Treatment Outcome Studies (DATOS) found that retention in MMT is an important predictor of treatment outcomes (Fletcher & Battjes, 1999, 82). • Longer time spent in MMT increases likelihood of remaining crime-free, and reducing use of heroin (Simpson & Sells; Ball & Ross, as cited in National Institute on Drug Abuse, 1995, 4-11,4-14).
Maintenance orientation	• Recent research reviewed by Ward et al. (1998b, 331) indicates that a maintenance (rather than abstinence) orientation is one of the program characteristics linked to successful retention. • According to Ward et al. (1998b, 324), citing research by Caplehorn et al. and McGlothlin and Anglin, programs with a "long-term maintenance philosophy" have better retention rates than programs with a "short-term maintenance philosophy" (independent of treatment goal).
Client/patient-centred approach	• Identifying and meeting individual treatment needs is associated with treatment success (Joe, Simpson & Hubbard, as cited in National Institute on Drug Abuse, 1995, 1-38) (See Section 4.2) • There are important considerations in meeting the needs of specific groups of clients/patients (see Part 7.0)

Table 4
(continued)

Program-Related Factors	Associated Treatment Outcomes
Accessibility	• Recent research reviewed by Ward et al. (1998b, 331) indicates that some of the program factors that are most likely to improve retention include accessibility, affordability and convenient hours of operation. • According to the TOPS study, clinic accessibility is related to retention (Condelli & Joe et al., as cited in Ward et al, 1998b, 325). • According to Maddux and colleagues (as cited in Ward et al., 1998b, 325), fee-for-service methadone has poorer retention rates than free treatment. • Factors that impede accessibility, such as treatment fees, have been found to have an adverse effect on retention (Maddux, as cited in National Institute on Drug Abuse, 1995, 1-50).
Integrated, comprehensive services	• Comprehensive services and the integration of medical, counselling and administrative services are associated with better treatment outcomes (Ball & Ross, as cited in National Institute on Drug Abuse, 1995, 1-38) (See Section 4.3). • The most effective opiate agonist maintenance programs provide methadone as well as other medical, behavioral, and social services (Leshner, 1999).
Medical care	• Given the prevalence of (often neglected) medical conditions among people who are dependent on opioids, the provision of primary and specialist medical treatment is a key aspect of MMT. • Lowinson et al. (1997, 410) notes that "providing primary care to substance abusers in methadone maintenance clinics could reduce the demand placed on emergency rooms and the need for hospitalization and thereby drastically cut the overall cost of their care." • See also Sections 7.4 to 7.7
Other substance use treatment	• Given the prevalence of multiple substance use behaviours among people who are dependent on opioids, the provision of other substance use treatment is a key aspect of MMT (See Section 7.1).
Counselling	• Based on their review of the evidence, Mattick, Ward and Hall (1998, 296) conclude that "there is reasonable evidence to suggest that counselling does add to the effectiveness of methadone maintenance treatment for some patients."

Table 4
(continued)

Program-Related Factors	Associated Treatment Outcomes
	• Greater amounts of counselling services are associated with better outcomes (McLellan; Strain et al., as cited in Strain, 1999b, 76). • There is evidence that comprehensive counselling services provided by experienced counsellors is a factor in treatment success (Ball & Ross, as cited in National Institute on Drug Abuse, 1995, 1-38). • There is a strong relationship between session attributes and therapeutic involvement. Session attributes were the number of individual counselling sessions, the number of times drugs/addiction or related health topics were discussed, and the number of times other topics were discussed in the first month of treatment (Joe et al., 1999, 117, 122). • "...patients expressing greater confidence and commitment after [three] months of treatment generally began with higher motivation at intake, had formed better rapport with counselors, and attended counseling sessions more frequently" (Broome et al., 1999, Abstract). • See Section 4.3.1
Mental health services	• Given the prevalence of mental health problems among people who are dependent on opioids, the provision of mental health services is a key aspect of MMT (See Section 7.7).
Health promotion, disease prevention and education	• Given the prevalence of risk behaviours for HIV, HCV and other blood-borne pathogens among people who are dependent on opioids, the inclusion of health promotion and disease prevention and education strategies is a key aspect of MMT (See Sections 7.5 and 7.6).
Ancillary services (in general)[8]	• Newman and Peyser (as cited in Mattick, 1998, 269) have suggested that there is a widespread belief that ancillary services are the most important components of effective methadone maintenance treatment programs, despite the fact that there is relatively little research evidence to support this idea.

8 Definitions of ancillary services vary depending on the research study, but Ward et al. (1998b, 324) use the term to refer to "services provided by methadone maintenance programs other than the dispensing of methadone", such as medical treatment, counselling and job training. In this report, medical services and counselling are also discussed separately.

Table 4
(continued)

Program-Related Factors	Associated Treatment Outcomes
	• Joe et al. (as cited in Ward et al.,1998b, 324) analyzed data from the TOPS study and found that increased retention was associated with providing clients/patients with access to medical, psychological and financial services during treatment. • Condelli (as cited in Ward et al., 1998b,324) also analyzed TOPS data and found that increases in retention were associated with higher ratings of the quality of services by clients/patients. • Research by Maddux et al. (as cited in Ward et al.,1998b, 325) indicates that services need to be tailored to the clients'/patients' needs, and programs should take into account the extent to which clients'/patients' are interested in using such services. • A study by McLellan et al. (as cited in Bell, 1998a, 169) found that the greater the level of services provided, the better the treatment outcomes. • "...those programs with higher average involvement by patients used more social and public health services, maintained more consistent attendance at counselling sessions, and served patients who collectively has more similar kinds of needs (Broome et al., 1999, Abstract) • "...patient confidence was higher when referred services were more readily accessible...even patients without unmet needs have higher confidence in programs that maintain higher levels of service utilization. Thus, the therapeutic environment appears to be more positive when a broad array of patient needs are being addressed" (Broome et al., 1999, 133). • Based on their review of the evidence, Hall et al. (1998b, 51) conclude that intensity of ancillary services is a probable factor in treatment outcomes. • See Section 4.3.2.
Program policies	• Clear policies and procedures are linked to longer retention (Ball & Ross, as cited in Lowinson et al., 1997, 412). • Clinic policies are one of the most important factors for retention (D'Ippoliti et al., 1998, 171).

Table 4
(continued)

Program-Related Factors	Associated Treatment Outcomes
Admission Criteria	• In a study by Bell et al. (as cited in Ward et al., 1998a, 193), the consequences for individuals not admitted to treatment were a 16-month delay in their entry into treatment, and their exposure in the interim to the risks of incarceration and death. • Given the potential for methadone maintenance treatment to reduce the harms associated with opioid dependence – and the consequences of not providing treatment, restrictive admission criteria should be avoided (See Section 5.1).
Assessment	• According to studies by Bell et al. and Woody et al. (as cited in Ward et al., 1998b, 326), programs that provide rapid vs. slow assessment have better retention. A study by Maddux et al (as cited in Ward et al., 1998b, 326) did not find a statistically significant difference, but did find that more of the clients/patients in a rapid assessment group initiated treatment, and there was a trend to increased retention among this group. • "...even very early events in treatment [i.e. during first month] can have effects on patient decision to remain [one] year later" (Joe et al., 1999, 122). • See Section 5.2.
Dosage	• Based on the evidence reviewed, the National Institute on Drug Abuse (1995, 1-38 to 1-40) concludes that the "establishment of adequate dosing policies" is associated with treatment success and "...methadone dosage should be based on the patient's individual needs, the goals of treatment, and progress in treatment." • The evidence reviewed by Strain (1999b, 76) indicates that higher dose is associated with better treatment outcomes. • Dose is one of the important factors for improved retention (D'Ippoliti et al., 1998, 171) • Recent research reviewed by Ward et al. (1998b, 331) found that programs with a flexible dosage policy are more likely to meet clients'/patients' needs. • Studies by Grabowski et al and Pani et al. (as cited in Ward et al., 1998b, 325-326) indicate that providing take-home doses is related to retention. • Flexible take home doses are an influential factor in retention (Lowinson et al., 1997, 412). • See Section 5.3

Table 4
(continued)

Program-Related Factors	Associated Treatment Outcomes
Methadone maintenance treatment during pregnancy	• Providing methadone maintenance treatment for pregnant women who are dependent on opioids has been shown to be effective in improving maternal and infant outcomes (See Table 1; See Section 7.3).
Duration of treatment	• Length of time in treatment is the major factor in successful outcomes (Ball & Ross, as cited in Lowinson, et al., 1997, 412) • Studies reviewed by Ward et al. (1998b, 312) indicate that longer length of time in treatment is associated with improved treatment outcomes after leaving treatment. • See Section 5.4
Urinalysis and monitoring of drug use during treatment	• Recent research reviewed by Ward et al. (1998b, 331) suggests that programs with a "non-punitive approach to illicit drug use"are more likely to meet the needs of clients/patients. • According to Stitzer et al. (as cited by Ward et al., 1998b, 326), using negative consequences, eg. reduced doses of methadone, to respond to illicit drug use during treatment has been co-related, in a number of studies, with clients/patients leaving treatment. • See Section 5.5.
Tapering from methadone	• Given the difficulties associated with tapering from methadone, a client/patient-centred approach to making this decision and engaging in this process is a key aspect of MMT. • See Section 5.6
Human resources	• "According to Kreek (1991), adequate staff numbers, training, and concern for patient needs and high staff stability (low staff turnover) are associated with improved patient outcomes" (Centre for Substance Abuse Treatment, as cited in National Institute on Drug Abuse, 1995, 1-39). • High staff morale is associated with better treatment outcomes (Lowinson et al., 1997, 412). • See Section 6.1

Table 4
(continued)

Program-Related Factors	Associated Treatment Outcomes
Practitioner attitudes	• According to recent research reviewed by Ward et al. (1998b, 331), program staff with positive attitudes to methadone treatment and to clients/patients is a factor that makes retention more likely. • "...there are positive consequences of a supportive and committed recovery environment for patient engagement and eventual success" (Broome et al., 1999, 134). • See Section 6.1
Quality of team-client/patient relationships	• "...patients expressing greater confidence and commitment after [three] months of treatment generally began with higher motivation at intake, had formed better rapport with counselors, and attended counseling sessions more frequently" (Broome et al., 1999, Abstract). • "Factors that influence longer retention are...trusting and confidential relationships between the patients and the program staff" (Lowinson et al., 1997, 412) • Based on their review of the evidence, Hall et al. (1998b, 51) conclude that "other relevant factors [in programs' effectiveness in reducing drug use and criminal activity] probably include the quality of the therapeutic relationships between patients and staff." • See Section 6.1
Training	• Staff training is associated with better treatment outcomes (Kreek; Centre for Substance Abuse Treatment, as cited in National Institute on Drug Abuse, 1995, 1-39). • See Section 6.1
Program environment	• Although relatively little research has been done in this area, "the organization of treatment is almost certainly an important component of effectiveness" (Bell, 1998a, 166). • See Section 6.2

Part 4: Program Development and Design Factors

The following sections provide further information on some of the program factors that are linked to treatment outcome (see Table 4).

4.1 Emphasis on Retention

Given the link between retention in treatment and other positive treatment outcomes, an emphasis on retention is an important feature of methadone maintenance treatment programs. According to research reviewed by Ward et al. (1998b, 330), longer retention in treatment is associated with improved post-treatment outcomes including reduced opioid use and reduced criminal activity. According to Lowinson et al. (1997, 412) many studies have confirmed that a longer length of time in treatment increases reductions in criminal behaviour and also increases socially productive behaviour (e.g. employment, school, homemaking). The caveat, as Hall et al.(1998b,53) state, based on their review of the evidence, is that the benefits of methadone maintenance treatment "continue only as long as patients remain in treatment." Consequently, in their review of historical and clinical issues related to MMT, Joseph, Stancliff and Langrod (2000, 361) conclude that "it may be necessary for patients to remain in treatment for indefinite periods of time, possibly for the duration of their lives."

As noted earlier, MMT has greater rate of retention compared to other treatment options, and increased retention in treatment is associated with a number of key program factors (see Tables 1 and 4).

4.2 A Client/Patient-Centred Approach

There has been a growing emphasis on how best to meet the needs of the individual client/patient. The National Institute on Drug Abuse's (1995, 1-38) review of the evidence found that "identification and meeting of patients' treatment needs" is a program characteristic that is associated with treatment success. A client/patient-centred approach includes taking into account the needs of specific groups of clients/patients (See Part 7.0).

4.3 Integrated Comprehensive Services

According to Leshner (1999), the best treatment programs are comprehensive and multidimensional: "The most effective [drug treatment] programs either provide on-site, or are closely linked with, a wide variety of treatment elements and support services. Moreover, since recovery can often be a long and complex process, treatment providers must be able to continually assess and adjust the patient's treatment and service to ensure that it is appropriate to the individual's changing needs. In addition to behavioral and pharmacological therapies, the patient may need other medical services, family therapy, parenting instruction, vocational rehabilitation, and social and legal services."

The potential components of an integrated comprehensive approach to MMT include:

- medical care, including treatment for HIV, HCV and other blood borne pathogens, as well as other medical conditions (see Sections 7.4 to 7.6)
- other substance use treatment programs (see Section 7.1)
- counselling (See Section 4.3.1)
- mental health services (See Section 7.7)
- health promotion, disease prevention and education (See Section 7.5 and 7.6); and
- a range of other ancillary services (See Section 4.3.2).

4.3.1 Counselling

According to Kidorf, King and Brooner (1999, 166), "....the necessity of counselling to address the complex problems of drug abusers was recognized by the founders of methadone treatment, and counselling has been a standard part of this treatment modality since its inception."

According to the findings of Ball and Ross (as cited in Mattick et al., 1998, 267), the work of counsellors in MMT programs can be described by ten activities: case management; liaising with other social service agencies; assessing new applicants; one-to-one counselling; brief contacts; group therapy; family and couples therapy; assessment for psychological problems; vocational counselling; and education.[9]

9 For more information on effective counselling strategies, readers are encouraged to consult the publication *Best practices - Substance Abuse Treatment and Rehabilitation* (Health Canada, 1999a).

. Brief contacts, one-to-one counselling and group work tend to account for most of the counselling activity in methadone treatment programs In addition, counsellors as well as medical, nursing and administrative staff play an important role in providing crisis intervention for people receiving treatment ((Ball & Ross, as cited in Mattick et al., 1998, 267-268).

4.3.2 Ancillary Services

Internationally, there is wide variation in the extent to which methadone treatment programs provide ancillary supports and services. Lowinson et al.(1997, 410) describes modern U.S. treatment programs as "a full-scale medical and human service agency attempting to address major social and medical problems using a variety of techniques." For example, U.S. methadone maintenance programs usually include some non-pharmacologic aspects such as: individual counselling; group therapy; couples counselling; urinalysis; contingency contracting; vocational rehabilitation; education programs; parenting classes; HIV testing and counselling; primary medical care services; psychiatric assessments; treatment of comorbid disorders (Strain and Stoller, 1999, 10).

According to Lowinson et al.(1997, 410), the services and supports provided by treatment programs will vary, depending on the stage of treatment[10]:

Stabilization includes: adjustment to medication; first annual physical examination; orientation to program regulations, expectations, routines, and services offered; psychosocial history and assessment; and referrals to appropriate medical and social service agencies.

Second stage includes: review and revision of original treatment plan; implementation of vocational goals (job training or employment); ongoing medical and mental health treatment, including treatment for HIV/AIDS or serious alcohol or multiple drug problems (this is extended as long as necessary); and possible provision of take-home medication, depending on progress in treatment and functioning.

Third stage includes: continued methadone maintenance, with once weekly (or less) visits; and minimal provision of services for those who are employed and no longer require intensive services.

10 Lowinson et al. (1997, 410) notes that methadone treatment in the United States has evolved into three phases—a stabilization period; a second phase in which the original treatment plan is reviewed and revised as necessary; and a third stage of continued methadone maintenance and minimal other service provision.

Given the diverse needs for support and services among people who are dependent on opioids (See Part 7.0), provision of ancillary services is a key aspect of MMT. According to Strain and Stoller (1999, 10): "The methadone clinic may be best viewed as a site for the comprehensive treatment of patients". They also note that providing services to address multiple problem areas related to drug use may be particularly important for individuals who are entering treatment.

Part 5: Program Policies

5.1 Admission Criteria

Specific admission criteria for entry into methadone maintenance treatment programs vary, depending on the country and the jurisdiction.[11]

According to Gossop and Grant and Uchtenhagen (as cited in Ward, Mattick and Hall, 1998a, 178), internationally, the criteria for determining who enters methadone maintenance treatment have become more liberal in recent decades; the age requirement has been reduced, as has the length of dependence required for entering treatment. In addition, people who use other drugs in addition to illicit opioids may no longer be excluded. Gossop and Grant and van Ameijden (as cited in Ward et al., 1998a, 179) note that minimal entry criteria – in "low threshold" programs in the Netherlands, for example – also reflect an effort to provide methadone maintenance treatment as a public health measure to reduce the transmission of HIV among injection drug users.

Ward et al. (1998a, 198-199) argue that, because illicit drug use is such a costly problem – for individuals and for society – admission to treatment should be given to anyone for whom "the individual and social harms associated with illicit drug use are likely to be reduced by entry to treatment". Since there is a "growing body of evidence (see Chapters 2 & 3) that opioid replacement therapy can be an effective intervention in the lives of many drug users....then the harm associated with not taking [a] person into treatment has to be weighed against the benefits of reducing the severity of their drug-related problems" (Ward, et al., 1998a, 190).

In addition, according to their review of the evidence, Ward et al. (1998a, 192) suggest that "individuals should not be excluded from treatment because of the extent and severity of their problems" because there are no reliable criteria to determine which groups of individuals will not respond to treatment.

5.2 Assessment

According to the studies reviewed by Ward et al. (1998a, 195), "there is no evidence that a protracted assessment process for opioid replacement therapy results in the selection of a more motivated group of patients. On the contrary, the evidence indicates that an individual's suitability for opioid maintenance should be done briefly and medication administered as quickly as possible." Ward et al.

11 See Glezen and Lowry (1999, 233-234) for an overview of admission criteria in the U.S. Information on criteria in Canada is available in the federal government's guidelines (Health and Welfare Canada, 1992, 9) and in relevant provincial guidelines, where available.

(1998a, 193) point out that individuals who did not complete the assessment process may have been discouraged by the process itself. Maddux et al. (as cited in Ward et al., 1998a, 195) suggest that, following a brief initial assessment of suitability for treatment and the initial administration of methadone, a more thorough assessment could be completed as clients/patients come in to get their medication.

5.2.1 Overall Purpose of Assessment

Based on their review of the literature, Ward et al. (1998a, 199) conclude that assessment should be understood, not as a series of barriers to exclude certain individuals from treatment, but as an opportunity to "establish the beginnings of a working relationship." In other words, assessment is the start of the treatment itself, and the assessment interview is an important first opportunity to introduce a person to the program, and what to expect from it. According to research by Bell, et al., Kauffman and Woody, Langrod, Miller and Rollnick, and Woody et al. (as cited in Ward et al., 1998a, 196) a client's/patient's first contact with a treatment agency influences the nature of the therapeutic relationship that ensues. Unfortunately, as Hunt et al. and Rosenblum et al. (as cited in Ward et al., 1998a, 196) found, methadone maintenance treatment has a poor image among injection drug users. Ward et al. (1998a, 196) suggest that, given their ambivalence about methadone, the assessment period should not be used to further discourage would-be participants, but rather should be seen as an opportunity to demonstrate the benefits of treatment. For example, the use of techniques such as motivational interviewing, developed by Miller and Rollnick, could be useful to help applicants consider the advantages and disadvantages of treatment (Ward et al., 1998a, 196). As Bell et al. (as cited in Ward et al., 1998a, 196) have pointed out, applicants need to make informed, rationale decisions as to whether or not to enter treatment, and the decision should be their responsibility. In addition to the purposes aforementioned, Miller and Rollnick (as cited in Ward et al., 1998a, 197) suggest that the assessment process is an opportunity to define a therapeutic relationship, and reconfigure the client's/patient's motivation to change their drug use and their attitudes to treatment.

5.2.2 Comprehensive Approach to Assessment

In addition to a medical assessment for the DSM-IV diagnosis of opioid dependence (Brands & Brands, 1998, 29), a comprehensive approach to assessment should include a "detailed exploration of the individual's history and current status" in terms of potential opioid-related

medical/health complications; social complications, and psychological difficulties (Ward et al., 1998a, 190). The assessment process should include:

- physical examination, taking vital signs (Glezen & Lowery, 1999, 236), and ordering laboratory tests such as HCV and liver-function tests
- medical assessment by a physician or nurse-practitioner (Glezen & Lowery, 1999, 236), including taking a history of infections (e.g. HIV, HCV, tuberculosis) and other drug-related medical problems to determine extent of physical harm resulting from drug use
- assessment of the history/pattern of opioid and other substance use (Stitzer & Chutuape, 1999)
- determining the extent of social life disruption (through questions about involvement in crime, prostitution, loss of employment, broken relationships and loss of housing)
- questions about past and current involvement in high-risk behaviours, i.e. for the transmission of STDs, and for the transmission of HIV, HCV and other blood-borne pathogens
- assessment of the extent to which drug use and related problems have led to anxiety and depression (Ward et al., 1998a, 191)
- urine testing (Glezen & Lowery, 1999, 236)
- breath screening test for recent alcohol use (Glezen & Lowery, 1999, 236), and
- a meeting with counsellors to prepare the client/patient for methadone treatment (Glezen & Lowery, 1999, 236)

The use of assessment instruments such as the Addiction Severity Index (McLellan et al. as cited by Ward et al., 1998a, 191) and the Opiate Treatment Index (Darke et al., as cited by Ward et al., 1998a, 191) could help to "systematise and standardise" the assessment process, and also provide consistent data for program evaluation purposes.

A comprehensive approach includes ongoing assessment to identify emergent problems and needs during treatment.

5.3 Dosage[12]

5.3.1 Pharmacology of Methadone

The pharmacology of methadone makes it a very useful drug for treating opioid dependence. The advantageous features include the fact that methadone:

- is taken orally, which avoids risks associated with injection drug use
- has a long half-life, which means only a single daily dose is needed
- accumulates in the body, which means a steady blood level is achieved easily
- effectively suppresses opioid withdrawal symptoms, which increases comfort/compliance among clients/patients
- develops cross-tolerance (or blockades) to the effects of illicit opioid use, which decreases use of illicit opioids during maintenance
- has no serious long-term side effects when used on a long-term basis (Novick et al. as cited by Ward et al., 1998h, 207; Walsh & Strain, 1999, 50-51).

As with any drug, many factors affect the rate at which methadone is metabolized; according to Blum (as cited in Ward et al., 1998h, 207) these include individual differences in metabolic rate, excretion rate, physiological status [e.g., pregnancy], pathological status, and consumption of other drugs.

According to Leshner (1999), "The commonly held belief that methadone....[is] simply [a] substitute for heroin is wrong. Although this medication is a μ-opioid agonist, it's pharmacological and pharmacodynamic properties are quite different from heroin. Instead of destabilizing the individual, as heroin does, methadone....stabilize[s] the patient and facilitate[s] a return to productive functioning."

12 Please note: practitioners who want to prescribe methadone will require more detailed information than is provided in this section, e.g. information on topics such as initial starting dosage, methadone half-life, time to peak plasma level, dosage increase in first week, dosage range, lethal dosage, dosage increases over time, monitoring dosage level, overdoses, side effects, drug interactions and other safety issues. This information can be obtained by consulting the federal guidelines (Health and Welfare Canada, 1992) and existing provincial guidelines, where available. Other resources include, for example, Brands and Brands (1998), Brands and Janecek (2000), and Brands, Kahan, Selby and Wilson (2000).

5.3.2 Use of Adequate, Individualized Dosages

Given that there is wide variation among individuals, in terms of their response to different doses of methadone (Strain, 1999b, 81), the evidence indicates that dosage of methadone should be individualized according to the needs of the person receiving the medication (Ward et al.,1998h, 206; Lowinson et al., 1997, 408)[13].

5.3.3 Phases of Dosing

The purpose and amount of the dosage will also vary, depending on the dosing phase.

Initial Dose

The initial dose of methadone is given to relieve the symptoms of opioid withdrawal and establish a baseline reference point for subsequent dosing (Lowinson et al., 1997, 408). According to their review of the evidence, Ward et al.(1998h, 213) conclude that there is "considerable agreement" that initial doses should range from 10 - 40 mg. Other sources, however, have suggested an initial dose ranging from 15-30 mg (Brands et al., 2000, 236) or 20-40 mg (Lowinson et al., 1997, 408). Brands et al. (2000, 236) cite Caplehorn's study in which initial doses higher than 40 mg have led to deaths after three days of treatment.

According to Lowinson et al. (1997, 408), the severity of withdrawal symptoms is not necessarily an indication of higher tolerance or higher initial or maintenance dose. According to Drummer et al. (as cited in Ward et al., 1998h, 211) for non-tolerant individuals, a dose above 40 - 60 mg may be lethal. Ward et al. (1998h, 213) conclude that the initial dose should be based on a "careful assessment" by a physician experienced with opioid dependency.

Some authors cite evidence that suggests that split, e.g., twice daily (Institute of Medicine (IOM), as cited in Strain, 1999a, 54) or serial dosing (Ward et al., 1998h, 213) may be useful when clinicians have doubts about the level of tolerance. Extra care should be taken in dosing people with severe liver dysfunction (Ward et al.,1998h, 213).

13 It is beyond the scope of this literature review to provide detailed information on the phases of dosing. There are very important safety issues concerning dosage induction and increases. Readers are encouraged to consult references cited in preceding footnote. Please note: initial starting doses should always be very low due to medical risk of overdose.

Induction

During the induction phase (Lowinson et al., 1997, 408), the initial dose is gradually increased over a period of weeks to achieve a level that is adequate and safe (Ward et al., 1998h, 211). According to Brands et al. (2000, 236), most clients/patients can be stabilized on methadone within two to six weeks of starting treatment.

Methadone has a long elimination half-life of 24 to 36 hours, which means that, 24 hours after the initial dose, half of the original dose remains in the body (Lowinson et al., 1997, 408). Methadone can accumulate in the tissues during successive doses (Ward et al., 1998h, 213). This means the level of methadone can increase, even without an increase in the dose level (Lowinson et al., 1997, 408). Accumulation continues until a steady-state is achieved after 4-5 half lives (Lowinson et al., 1997, 408). As it can take five days to achieve a steady state plasma level of methadone — and given that Caplehorn has shown that methadone's long half-life can result in an accumulation of methadone and a resulting overdose one or two weeks after treatment begins[14] — Brands et al. (2000, 236-237) suggest that dose adjustments in the range of 5-15 mg of methadone should be made only every three or four days, "depending on the severity and daily duration of the patient's withdrawal symptoms or drug cravings."

Lowinson et al. (1997, 408) divides the induction phase into "early" induction and "late" induction. In early induction, the focus is on relieving withdrawal symptoms and reducing craving by reaching a dosage that is equivalent to the established opioid tolerance level. Late induction involves increasing or decreasing the dosage to a level that is adequate to achieve the desired effects (i.e., prevent/reduce withdrawal symptoms; prevent/reduce drug craving; prevent relapse; restore disrupted physiological functions to or toward normalcy). For example, dosage may need to be increased to create cross-tolerance or a "blockade" effect and discourage the use of illicit opioids, or a lower — but still effective — dosage may be sought. Brands et al. (2000, 237) suggest that: "once a daily dose of 60-80 mg has been reached, the rate and amount of dosage adjustments should be decreased to no more than 5-10 mg every one to two weeks."

14 For further information on how to prevent methadone overdose, the reader is encouraged to consult the federal guidelines (Health and Welfare Canada, 1992), and the relevant provincial guidelines (where available).

Maintenance

During the maintenance phase, an adequate, stable dosage of methadone is continued indefinitely. A steady-state of methadone is achieved and maintained, sometimes for long periods of time (Lowinson et al., 1997, 408). Brands et al. (2000, 237) note that ongoing monitoring of the adequacy of the dose is based on client/patients' self-reports of withdrawal symptoms. They suggest that clients/patients should be asked how long the methadone is lasting in terms of relieving withdrawal symptoms. The optimal dose is one that is effective "throughout the night". They suggest that dose adjustments should not be used as a means of either rewarding or punishing clients/patients. They point out that dosage increases do not necessarily encourage clients/patients to seek higher-than-needed doses, citing research by Resnick, Butler and Washton that indicates instead that clients/patients who were allowed to self-adjust their doses made "only moderate adjustments, well below the maximum attainable dose"(Brands et al., 2000, 237).

The issue of dose adequacy is also framed by the longstanding debate about the merits of "high" versus "low" dose methadone. This debate is largely about what dose level is deemed "adequate" (Ward et al., 1998h, 214). Questioning of the original high-dose protocol established by Dole and Nyswander, however, has led to the development of low-dose methadone programs in the United States. Research findings, however, tend to support the original high-dose protocol. For example, in a recent study by Strain, Bigelow, Liebson and Stitzer (1999, Abstract) both moderate- and high-dose methadone treatment resulted in reductions in illicit opioid use, but the group of people who received high doses had significantly greater decreases in illicit opioid use. Brands et al. (2000, 236) note that research by Strain, Stitzer et al. and Caplehorn and Bell has suggested that higher methadone doses (greater than 60 mg/day) are more effective than lower doses in terms of retaining clients/patients in treatment, and decreasing heroin use.

In terms of determining what the limits of methadone dose should be, the sources consulted for this review either do not set specific limits (Lowinson et al., 1997, 408), or suggest a variety of daily dose ranges: 50 - 100 mg/day (Ward et al, 1998h, 214); 20 -100 mg/day, depending on their needs (Strain, 1999b, 81); or from 50-120 mg/day (Brands et al., 2000, 236). Some people receiving methadone may require more than 100 mg/day (Strain et al., as cited in Leavitt, Shinderman, Maxwell, Chin and Paris, 2000, 408). The key aspect in determining dose, according to Brands et al. (2000, 236) is to provide an "optimal dose", i.e., one that "relieves withdrawal symptoms and drug cravings without sedation or other side-effects."

[Tapering the Methadone Dose (See Section 5.6)]

5.4 Duration of Treatment

Ward et al. (1998b, 330) examine the viability of long and short-term approaches to treatment – including studies of treatment duration and post-treatment outcome; reasons for leaving treatment and post-treatment outcome; outcomes of removing treatment; and predictors of treatment tenure. They (Ward et al.,1998b, 329) conclude that a short-term approach to methadone maintenance will only be suitable for a minority of people who are opioid dependent. These individuals tend to be those with a short history of opioid dependence and access to significant social and psychological resources.

The majority of clients/patients will resume heroin use if they stop taking methadone (Ward, Mattick & Hall, as cited in Ward, Mattick and Hall, 1998c, 337). According to Lowinson et al. (1997, 412) Ball and Ross "found that 82% of the patients had relapsed to intravenous drug use after having been out of treatment for 10 months, or more, with almost half (45.5%) relapsing after having been out of treatment for one to three months." Ward et al. (1998b, 329) conclude that the goal of treatment for most people who are opioid dependent should be *maintenance* on methadone. This is because a maintenance orientation increases the likelihood that people will remain in treatment – and will thereby achieve the individual (and societal) benefits of treatment. Lowinson et al. (1997, 412) also point out that Ball and Ross found that length of time in treatment was the "major factor in outcome."

In their summary, Ward et al. (1998b, 330-31) suggest that "the evidence does not allow the specification of an optimum duration for methadone maintenance which would be applicable to all individuals." They also note that some evidence suggests that the majority of people are more likely to benefit from two to three years of maintenance on methadone, compared to shorter periods. In general, however, longer periods of treatment are better than shorter periods of treatment because longer stays in treatment are associated with better outcomes, specifically reduced illicit opioid use and reduced criminal activity. Individuals who leave methadone maintenance treatment before they have made significant changes, are much more likely to relapse to opioid use and criminal activity. For most people who are opioid-dependent, limiting the duration of treatment – either for financial reasons or because of program philosophy – results in serious negative consequences.

Ward et al. (1998b, 331) conclude that "the optimum duration for methadone maintenance is, therefore, for as long as the patient benefits from taking a daily dose of methadone, and given the chronic, relapsing nature of opioid dependence, there is no reason to believe that this would be for a short period of time while heroin remains relatively freely available in our society."

Involuntary discharge from treatment should be approached very cautiously given the potential consequences of discharging people from treatment. Lowinson et al. (1997, 412) note that Dole and Joseph "found that death rates for discharged persons were more than twice those of patients still in treatment." The major difference in the cause of deaths was the increase in drug-related deaths after discharge. Although that study found a sharp increase in narcotics-related deaths after leaving treatment, since that time, the AIDS epidemic has arrived, and "by 1986, AIDS had become the major cause of death among methadone patients in New York City programs." Recent research by Salsitz, Joseph, Frank, Perez, Richman, Salomon, Kalin and Novick (2000, 392) found that complications resulting from HCV infection were the second most common cause of death among clients/patients in a methadone maintenance treatment program, after smoking related conditions (Lowinson et al, 1997, 412).

5.5 Urinalysis and Monitoring of Drug Use during Treatment

5.5.1 Purpose of Urinalysis

In Canada – as in most other countries – people being treated with methadone maintenance must provide urine samples for toxicology screening. These samples are tested both to monitor compliance with methadone and to confirm self-reported use of any other drugs. Although urinalysis has traditionally been a component of most methadone treatment – and the results have been used primarily for patient management and program evaluation and research purposes (Ward et al., 1998i, 240) – it is, nevertheless, controversial. Ward, Mattick and Hall (1998i, 259) point out that urinalysis actually only measures drug use as an outcome, but there are many other important outcomes that should be taken into account such as improved health, social and psychological functioning and reduced criminal involvement.

5.5.2 Advantages and Disadvantages

Ward et al. (1998i, 242-243) summarize the suggested advantages and disadvantages of urinalysis as follows (see Table 5):

Table 5
(based on Ward et al., 1998i, 242-243)

Advantages of urinalysis	Disadvantages of urinalysis
• Objective measurement of drug use on which to base clinical decisions • Monitoring of illicit drug use for program evaluation • Monitoring of patient compliance in taking methadone • Reduction in illicit drug use • Suitability of results for legal purposes • Increased patient contact with the treatment program • Provision of a basis for staff-patient bond	• Implied distrust of patients • Humiliation of patients and staff • Inaccuracy as an indicator of drug use • Expense

Ward et al. (1998i, 244-249) note that the most reliable method of detecting drug use is to collect and test urine samples on a daily basis, but it is not usually a practical option due to the costs, time and inconvenience for clients/patients. As a result, programs use a number of different approaches – fixed-day schedules and random schedules (including random selection of daily collected samples; fixed-interval, and random-interval schedules) – none of which ensure complete reliability in terms of detecting drug use, for various reasons.

The supervised collection of urine samples is a common practice, and is intended to ensure that samples are not tampered with. Without supervision, however, Ward et al. (1998i, 248) note that:"....it is probably impossible to devise a tamper-proof collection system." Meanwhile, there are important negative effects that result from supervision including the humiliation experienced by both clients/patients and staff. According to Ward et al.(1998i, 249): "The extent to which the negative effects of supervision on patients are worthwhile has to be weighed against the need for accurate urinalysis results."

Based on their review of the evidence, Ward et al. (1998i, 251), conclude that, if the main purpose of using urinalysis is to deter the use of illicit drugs, then research results suggest that urinalysis is not an effective method of deterrence. They argue that: "On the basis of the *available* evidence, it has to be concluded that there is no compelling evidence that the absence of urinalysis leads to an increase in illicit drug use."

5.5.3 Contingency Management

Despite the fact that there is little evidence to support the use of urinalysis as a means of decreasing illicit drug use, Ward et al. (1998i, 252) point out that there has been a great deal of emphasis on how best to use urinalysis results to affect drug-using behaviour. Much of this work has involved the use of behaviour modification (or contingency management) techniques — offering positive reinforcements such as increased doses and take-home privileges for negative screens, and applying negative reinforcements such as dose reductions or expulsion from treatment for positive screens.

There are distinct differences in how various authors view the effectiveness of contingency management techniques. According to a review by Robles, Silverman and Stitzer et al. (1999, 196), the use of contingency management techniques to impact on a range of behaviours — including "drug abstinence" — is effective. They (Robles et al., 1999, 218) conclude that: "Taken together, the results clearly show that drug use can be reduced when positive consequences (take-home privileges, dose increases, money) are offered for abstinence or when adverse consequences (dose decreases, treatment termination) are made contingent on continued drug use....".

The review by Ward et al. (1998i, 254) offers a somewhat different interpretation. They point out that "....although there is suggestive evidence that supports the use of dose increases and decreases in reducing illicit drug use among methadone patients, only the use of take-home methadone as a reward has been widely evaluated and found to be effective." In addition, programs that use negative consequences tend to achieve only small reductions in drug use, and drop-out rates from such programs are high. Given that people who do not receive treatment are at high risk for infection with HIV, HCV and other blood-borne pathogens, practices that increase the drop-out rate are being increasingly questioned.

Although Robles et al. (1999, 218-219) note that "aversive procedures may cause treatment dropout and associated adverse outcomes," their overall support for the use of contingency management techniques in methadone treatment appears high. However, Ward et al. (1998i, 253) are much stronger in their critique of negative reinforcement techniques, concluding

that: "Although popular in the past, the use of negative consequences and expulsion from treatment as a response to drug-positive urine samples has little experimental support and may have serious public and individual health consequences." They (Ward et al., 1998i, 254) argue that such a decision should only be considered as a last resort because of the consequences, i.e. inflicting on clients/patients the pain of withdrawal.

5.5.4 Self-reports of Drug Use

The use of urinalysis to monitor drug use is based on the assumption that people receiving treatment cannot be trusted to tell the truth about their drug use. Research reviewed by Ward et al. (Magura et al.; Magura & Lipton, as cited in Ward et al.,1998i, 254-255), however, suggests that, under certain circumstances, people will provide reasonably accurate reports about their use of drugs. Traditionally, however, these conditions have not been the status quo in methadone maintenance treatment programs. Magura et al. (as cited in Ward et al., 1998i, 255) found that self-report provides as much information about drug use as does urinalysis, but both methods used together reveal more than either one used alone. Ward et al. (1998i, 260) conclude that "research has consistently demonstrated that under conditions where methadone patients do not have to be concerned about being punished for doing so, they will be truthful about their drug use." A recent review by Darke (1998a, 262) explored the literature on the reliability and validity of self-reported drug use, criminality and HIV-risk taking among injection drug users. Darke concludes the "self reports of illicit behaviours are sufficiently reliable and valid to provide descriptions of drug use, [drug] related problems, and the natural history of drug use."

5.5.5 Hair Analysis

It is important to note that there are other options for monitoring drug use that may offer some advantages for practitioners and people receiving treatment. For example, according to McPhillips, Strang and Barnes (1998, 287), hair analysis is a "powerful new tool [that] should be more widely employed in clinical practice and psychiatric research." According to studies reviewed, DuPont and Baumgartner (1995, Abstract), hair analysis is more effective than urinalysis at identifying drug users.

5.6 Tapering from Methadone

In the context of methadone maintenance treatment, the term "tapering" is a term that encompasses measures that are sometimes referred to as either "withdrawal management" or "detoxification".

Based on their review, Ward et al. (1998c, 353) conclude that it is necessary to manage methadone withdrawal syndrome and to deal with people's fears of tapering from methadone. They suggest that the tapering process should involve:

- a slow tapering of the methadone dose[15]
- an individualized approach to rate of dose reduction
- involving clients/patients in decision making processes, such as whether or not to reduce doses "blindly" (i.e., without client/patient knowing about the reduction) (Ward et al., 1998c, 354)
- the provision of accurate information about the tapering experience as it is happening
- the provision of supportive counselling during the transition from maintenance to abstinence
- if possible, the continuation of counselling after methadone administration ceases to help address post-methadone syndrome (Ward et al., 1998c, 355), and
- if possible, involvement in after care services and programs (Ward et al., 1998c, 355).

According to Ward et al. (1998c, 354), tapering is a very difficult time for clients/patients so the process of disengagement should be considered part of the treatment process, rather than the end of treatment.

Since the likelihood of relapse is so high, Ward et al. note that people who want to leave methadone should be advised that tapering off methadone is an option, but that it is possible to continue on methadone maintenance and lead a fulfilling life (Ward et al., 1998c, 353). In some cases, people who no longer need a highly structured treatment program may be able to continue receiving "medical" maintenance (Novick & Joseph, as cited in Ward et al., 1998c, 338).

15 According to Brands et al. (2000, 246), tapers of 5 mg per week or less have been shown by Senay, Dorus et al. to be more successful than more rapid tapers, and tapering may need to proceed even more slowly when the dose descends below 20 mg.

The decision to taper off methadone may be influenced by any or all of the following: clients'/patients' expectations about tapering off methadone quickly and without any difficulties; pressure from family and friends who may not recognize that recovery is a long-term process; clients/patients sense of the stigma associated with being on methadone; and/or staff's beliefs and attitudes about the abstinence and/or methadone (Ward et al., 1998c, 354)

The inconvenience of regular attendance at pharmacy/physician's or counsellor's office/clinic may also be a reason for stopping treatment.

As Ward et al., (1998c, 354) point out: "A patient-centred approach to these issues is one where staff orient their attitudes about treatment to the patient rather than to their own beliefs about the desirability of this or that practice."

Part 6: Program Team and Environment

6.1 Training

The way in which team members deliver methadone maintenance treatment – including their attitudes to methadone maintenance treatment and to the people receiving it – are important factors in treatment outcomes (Ball & Ross, as cited in Bell, 1998b, 362). For example, Caplehorn, Lumley and Irwig (1998, 60) found that the strength of team members' commitment to abstinence-oriented treatment is associated with decreased retention in treatment. They note that the results of their study "highlight the need for more attention to be paid to the attitudes, beliefs and working practices of methadone program staff." They argue that team members need to be "better selected, trained and directed" (Caplehorn et al., as cited in Caplehorn et al., 1998, 60) and point out that a related study found that staff attitudes can be changed by "a clear statement of official policy and an associated educational campaign" (Caplehorn et al., as cited in Caplehorn et al. 1998, 60).

The fact that team members and "treatment philosophy, attitudes and beliefs" influence treatment outcomes, means that training – for staff providing medical, dispensing or counselling services – may be a key step in improving treatment outcomes (Ball & Ross; Szapocznik & Ladner; Bell et al., as cited in Bell, 1998b, 362). In addition, education provides not just knowledge and skills, but motivation and involvement of physicians (Bell, 1998b, 362-63).

Bell (1998b, 362-363) describes the training initiatives in Australia which have sought to expand methadone maintenance treatment in primary care settings by training primary care physicians and pharmacists. He also summarizes the work of a national committee which reviewed the components of treatment, the needed skills, and identified the following areas (including specific learning objectives and competencies for each area):

- assessment – determining suitability for treatment, followed by a comprehensive assessment of health, welfare and psychological issues
- safe and effective prescribing
- delivery of appropriately structured treatment
- addressing the individual health care needs of people receiving treatment; and
- maintaining professional conduct in delivering treatment.

Bell (1998b, 375) argues that the Australian experience demonstrates the value of initial and ongoing training that includes "values clarification" alongside empirical evidence about substance abuse treatment. Bell suggests that training helps in the recruitment of professionals, and is valued by staff in existing programs. At the same time, Bell adds a note of caution by pointing out that training "cannot compensate for a lack of resources devoted to treatment."

6.2 Program Environment

According to Bell (1998a, 166), the way in which treatment programs are organized is "almost certainly an important component of effectiveness," but one which has not been well researched. A structured approach to treatment offers a number of advantages. It ensures safety for clients/patients and staff, including freedom from harassment from staff and other clients/patients; fairness, and consistency/reliability. It requires enforcement of safe limits: clarification and consistent application of clear rules and expectations. A structured approach also requires daily attendance because this is valuable in early phases of treatment. At the same time, however, daily attendance should not be allowed to become an "obstacle to social reintegration." In addition, a structured approach provides an alternative to crime and drug seeking activities; facilitates establishing a relationship with clients/patients; and makes treatment safer by minimizing risk of diversion, injection and erratic quantities of medication. A structured approach is also an opportunity to provide relevant information at appropriate points (Bell, 1998a, 167). It allows program staff to establish a therapeutic relationship (Bell, 1998a, 168). A structured approach should be coherent, ie. its policies should be clear and non-contradictory (Bell, 1998a, 169).

Some of the obstacles to providing an effective treatment program environment include: attitudinal obstacles, including assumptions about abstinence, negative attitudes about symptom relief (Bell, 1998a, 170); imposing barriers to treatment to test motivation; low doses of methadone; time-limited treatment; abstinence orientation; control-oriented regulations and policies that lead to an "adversarial relationship between patients and staff" (Bell, 1998a, 171); low staff morale due to stressful working environments, conflict about treatment goals, and lack of team approach, poor funding, poor facility maintenance.

Bell makes a number of suggestions about how a program environment could be improved through, for example:

- utilizing a "treatment" ethos in which all interactions with clients/patients are part of their care: "Thus issues of anger, conflict and acting out become part of the materials being worked with, rather than an irritation or obstacle to the smooth running of the clinic" (Bell, 1998a, 173)

- locating methadone treatment in primary care settings. Advantages include increased anonymity, less stigma, increased accessibility, reduced loitering, etc. (Bell, 1998a, 173)

- provide adequate doses, and address clients'/patients' ambivalence about methadone

- provide structured, well-organized treatment programs with clear rationale and objectives, clear job descriptions, clear lines of communication, and regular team meetings.

- prompt intake

- clarification of policies and expectations at outset of treatment

- conducting detailed assessments and developing treatment plans, and

- maintaining clear records, including documentation of key issues for clients/patients.

Part 7: Specific Considerations

Individuals entering methadone maintenance treatment have many, highly diverse needs related to their drug use and other life circumstances. A client/patient-centred approach to methadone maintenance treatment includes taking into account these multiple needs of various client/patient groups.

7.1 MMT and Multiple Substance Use Behaviours

Multiple substance use behaviours among people who are receiving methadone maintenance treatment is very common. Although methadone maintenance treatment is an effective form of treatment, it cannot be considered a "cure" for opioid dependence. Based on their review, they conclude that many people who receive treatment actually continue to use illicit drugs, although at a reduced rate (Hall et al., 1998b, 50). Commonly used substances include heroin, cocaine, benzodiazepines, alcohol, marijuana and tobacco (Stitzer and Chutuape, 1999, 86).

Most people who are dependent on opioids have a history of multiple substance use behaviours. In their review of other substance use behaviours in methadone treatment, Stitzer and Chutuape (1999, 87) cite a study by Brooner et al. which found that clients/patients may have up to four or five substance use or dependency problems, and this number is even higher among clients/patients with comorbid psychiatric disorders including antisocial personality disorder. They note that the prevalence of substance use among methadone clients/patients, as illustrated by the Brooner et al. study, was as follows: cocaine (lifetime) 77%, (current) 43%; alcohol dependence 25%; marijuana dependence 20%; and benzodiazepine dependence 20%. Stitzer and Chutuape also point out that other studies have found higher rates of marijuana use (they cite Nirenberg et al.), and high rates of tobacco use (92%).

Heroin use is continued by up to 60% of methadone clients/patients, but as Stitzer and Chutuape (1999, 88) point out, during treatment, the amount and frequency of heroin use is lower compared to pre-treatment levels. They note that heroin use during treatment is affected by: "maintenance dose of methadone", as well as by length of time in treatment (with a decrease in the rates over time), and the program's level of "tolerance" for this behaviour. In addition, links between the use of different substances have been identified, such as:

- those who used cocaine in the last three months of treatment were six times more likely to have used heroin during treatment, compared to those who had not used cocaine (Hartel et al., as cited in Stitzer & Chutuape, 1999, 88)

- cocaine and benzodiazepine use are associated with "higher rates of heroin use, greater risk-taking behaviours and poor treatment response" (Stitzer & Chutuape, 1999, 92)

While much of the research reports that substance use, included heroin use, tends to decrease during methadone maintenance treatment (Hartel et al., as cited in Stitzer & Chutuape, 1999, 88-89), continued opioid use is common. For example, Belding, McLellan, Zanis and Incmikosk (1998, 490-491) found that a substantial proportion (22%) of people receiving methadone at their centre continued to use illicit opioids after at least six months in treatment. Given that there are compelling reasons for trying to reduce illicit opioid use, effective methadone maintenance interventions may require either motivational interventions (Saunders, Wilkinson & Phillips, as cited in Belding et al. 1998, 491), or external contingencies (Brooner et al; McCarthy & Borders; Silverman et al., as cited in Belding et al., 1998).

The review by Stitzer and Chutuape (1999) provides a valuable overview of the medical, psychological, and behavioural risks for people who continue to use substances during methadone maintenance treatment. This information is summarized in Table 6.[16]

Table 6
(based on Stitzer & Chutuape, 1999, 89-92)

Substance	Risks
Heroin	• Exposure to HIV infection, hepatitis B and C infections, abscesses, other infections from contaminated equipment. • Increasing physical dependence and increasing levels of withdrawal discomfort (based on "speculation") • Continued association with drug users and drug using lifestyle.
Cocaine	• Exposure to HIV infection, hepatitis B and C infections, abscesses, other infections from contaminated equipment. • Continued association with drug users and drug using lifestyle. • Severe hypertension • Aortic rupture • Restricted blood flow to organs (heart attacks, kidney and intestine damage) • Spontaneous abortions

16 For information on potential drug-drug interactions, readers are encouraged to consult: Brands and Janecek (2000). See also Gourevitch and Friedland (2000) for a detailed article on possible interactions between methadone and medications used to treat HIV infections.

Table 6
(based on Stitzer & Chutuape, 1999, 89-92)
(continued)

Substance	Risks
	• Placental disruption • Death due to medical complications • Death due to trauma and injury (homicide, suicide, accidents) • Mental confusion, anxiety, panic attacks, agitated delirium, paranoid psychosis
Alcohol	• Increased mortality • Disruptive behaviours • Blackouts • Aggressive or violent behaviours • Arrests • Accidents • Loss of employment • Disruption of family life • Deterioration of mental and physical health – liver disease leading to acute and chronic cognitive impairment, heart, kidney and blood disorders • Death • Premature treatment discharges associated with absenteeism and disruptive behaviour at clinics
Benzodiazepines	• Sedation • Memory impairment (increasing chance of risky behaviour) • Overdose (in combination with another sedating drug) • Suicide • Physical dependence and withdrawal symptoms (rebound anxiety and agitation, insomnia, tension, sweating, tremulousness, ringing in the ears, increased sensitivity to noises and to light, and sensory and perceptual distortions, withdrawal delirium and seizures) • Road accidents (especially in combination with alcohol)

Table 6
(based on Stitzer & Chutuape, 1999, 89-92)
(continued)

Substance	Risks
Marijuana	• Motor incoordination • Memory impairment • Anxiety and panic attacks • Perceptual distortions • Toxic psychosis • Lung diseases - bronchitis, emphysema, lung cancer
Tobacco	• Elevated risk of mortality and morbidity (as in general population) — heart attack, stroke, lung cancer, other chronic lung diseases and premature death

Given the risks involved in continued and multiple substance use, retaining people who continue to use substances while in methadone maintenance treatment is an important element of a harm reduction strategy. According to Magura, Rosemblum and Rodriguez (1998b, Abstract) "From a harm reduction perspective, high priority should be given to retaining cocaine-using patients in methadone maintenance, intensifying in-program services for those with anti-social personality disorder, bipolar disorder, or alcoholism, as well as increasing access to needle exchanges and condoms."

Stitzer and Chutuape (1999,100-114) also make extensive recommendations for the treatment and clinical management of substance use by type of drug. These recommendations, as well as information from Best, Glossop, Greenwood, Marsden, Lehman and Strung (1999, 31) and Budney, Bickel and Amass (1998, 493) are summarized in Table 7.[17]

17 Where clients/patients have multiple substance use behaviours, in addition to opioid dependence, a range of treatments can be used in combination with methadone maintenance treatment. For more information on the most effective substance use treatment approaches, readers are encouraged to consult Health Canada (1999a) as well as other forthcoming publications on substance abuse-related best practices from Health Canada.

Table 7
(based on Stitzer & Chutuape, 1999, 100-114; Best et al., 1999, 31; Budney et al., 1998, 493)

Substance	Treatment Options	Clinical Recommendations
Heroin	• Increase methadone dose • Behavioural or counselling interventions • Interventions designed to reduce cocaine use may be beneficial	• Maximize dose for those continuing to use heroin. • Monitor through urinalysis. Supplement with behaviour interventions. Target heroin and cocaine use simultaneously where necessary.
Cocaine	• Increased counselling and surveillance combined with motivational interventions. • Aversive control strategies (divided opinion about this – strong public health reasons for retaining individuals in treatment) • Behavioural interventions utilizing positive reinforcers for abstinence	• Intensified counselling treatment and urine surveillance. • Motivational interventions with positive or negative incentives. • Given continued HIV risk with cocaine injecting, discharge may not be appropriate. Methadone treatment can decrease cocaine use and other risk behaviours even without abstinence.
Benzo-diazepines and Other Sedative-Hypnotics	• Detoxification with careful supervision. • Outpatient detoxification has a low success rate.	• If a prescription is necessary for treatment of a specific condition, employ benzodiazepines with lower abuse liability or use nonbenzodiazepines. • Monitor use through urine testing. • Inpatient detoxification plus intensive aftercare plan. • Reevaluate mental health status once benzodiazepine free. • Intensive treatment services including contingent incentive programs.

Table 7
(based on Stitzer & Chutuape, 1999, 100-114; Best et al., 1999, 31; Budney et al., 1998, 493)
(continued)

Substance	Treatment Options	Clinical Recommendations
Alcohol	• Psychosocial treatment (individual or group) • Behavioural incentive programs for abstinence • Medications (Antabuse, disulfiram). **Note: Naltrexone cannot be used with methadone clients/patients.**	• Monitored disulfiram treatment. • Inpatient detox may be required. • Routine breath alcohol monitoring with contingencies.
Marijuana	• "...there does not, in fact, appear to be a clear relationship between the use of marijuana and the use of other drugs (heroin, cocaine, and benzodiazepines) during treatment, nor do any data support a relationship between marijuana use and poor treatment response in methadone programs. While clinics may not want to ignore marijuana use completely, these findings suggest that they should consider ranking its use relatively low in their priorities for clinical attention and resources." (Stitzer & Chutuape, 1999, 112)	• "While cannabis use is highly prevalent among opiate misusers in treatment, its relationship to treatment outcome is complex and requires greater research scrutiny." (Best et al., 1999, Abstract)
Tobacco	• Smoking cessation treatment	• Smoking cessation programs: - nicotine patch, nicotine gum - face-to-face therapy - social support from counsellor - relapse prevention problem solving.

7.2 MMT and Women

Statistics from the United States indicate that, despite the fact that overall rates of heroin and injection drug use are lower among women than men, the actual number of women involved is still significant. Over 700,000 women have used heroin in their lifetime, more than 850,000 have injected drugs, and almost 150,000 used heroin in 1996 (SAMHSA, as cited in Jones, Velex, McCaul and Svikis, 1999, 251). Furthermore, many of these women are of child-bearing age. Other U.S. statistics also indicate that, although some women reduce their drug use during pregnancy, a significant number continue to use drugs throughout pregnancy (NIDA, as cited in Jones et al., 1999, 252). In Canada, heroin (and other drugs such as cocaine, crack, LSD, amphetamines) are used primarily by subgroups of women such as street-involved women. Some researchers have noted that since surveys of drug use do not tend to include women in these subgroups, the use of heroin may be under reported (Hewitt et al.; Office of Alcohol, Drugs and Dependency Issues; Canadian Centre on Substance Abuse & Addiction Research Foundation, as cited in Health Canada, 2001).

7.2.1 Treatment Issues

Many women who use substances experience a range of issues and encounter barriers which impact on and relate to treatment. Much of the research that has been done in this area is relevant for women who are dependent on opioids.

The risk factors and reasons for starting to use substances are different among women than men (Stein & Cyr, as cited in Jones et al., 1999, 252, 254). For example, according to the research reviewed by Jones et al. (1999, 254) women who use substances are more likely to have a family history of alcohol or drug dependence; tend to have high rates of childhood sexual abuse; and are very likely to have relationships with substance-using men and experience violence at the hands of their partners.

Compared to men who use substances, women who use substances tend to function more poorly in terms of physical health, psychological well-being, relationships, social functioning, and economic stability (see Table 8 based on Jones, et al., 1999, 251-255). Some of the physical health differences may be due to gender differences in how substances are metabolized.

Table 8
(based on Jones, et al., 1999, 251-255)

Substance	Risks
Physical health	• medical problems tend to be more severe than men's • gynecologic problems and STDs common • increased risk for reproductive complaints • increased vulnerability to HIV infection.[18] • same injection drug use-related risks as men for hepatitis and many other medical problems
Psychological and social health	• increased risk of affective disorders, attempted suicide, psychopathology, low self-esteem, anxiety, depression • low levels of coping skills • high psychological distress • difficulties in relationships and social functioning • lack of confidence in their communication skills • passivity in partner relationships • increased likelihood of being separated or divorced • feelings of loneliness • smaller social support networks • more unresolved sexual issues • social isolation • fewer friends • fewer romantic relationships • more difficulties socializing

18 Jones et al. (1999, 252-253), citing research by McCaul and Svikis, note that: "compared to men, drug-abusing women are at greater risk for HIV infection because the virus is more easily transmitted by sexual intercourse from men to women, women are likely to have unprotected sexual intercourse to finance their addiction, and women's sexual partners are more often individuals who engage in high-risk behaviours."

Table 8
(based on Jones, et al., 1999, 251-255)
(continued)

Substance	Risks
Economic and legal status	• poorer occupational functioning • often economically dependent on men via prostitution or exchanging sex for drugs, food, shelter, etc. • low levels of vocational training and job skills • high rates of unemployment • overestimate their job capabilities relative to their education, job training and work experience • less likely to engage in socially deviant behaviour involving the legal system • majority have at least one legal conviction.

7.2.2 Barriers to Treatment

According to the Institute of Medicine (IOM, as cited in Jones et al., 1999, 255), only a small proportion of the women who need substance use treatment actually receive it. Jones et al. (1999, 255) describe the numerous barriers which researchers have identified that may account for this, such as:

- lack of treatment slots
- lack of financial resources
- insufficient women-focussed outreach
- gender and cultural insensitivity in treatment programs
- fear of criminal prosecution, and legal consequences such as loss of child custody
- lack of child care
- lack of transportation
- lack of health insurance coverage
- no one to care for other dependent children or family members

- ineligibility for treatment medications if pregnant or not using reliable birth control
- social stigmatization of women drug users, including stigmatization by medical community
- lack of treatment that addresses women's issues, including lack of attention to psycho social issues; exclusive focus on relapse prevention and abstinence-oriented counselling.

Comprehensive, gender-specific models for drug treatment services for women must address multiple areas of need (see Table 9).

Table 9
(based on Finnegan; Finnegan; Jansson et al; McCaul & Svikis, sas cited in Jones et al., 256, Table 12.1)

Medical	Relationships and Social Functioning	Special Considerations	Psychologic	Economic
• General health care • Obstetric and gynecologic care • HIV prevention • Nutritional counselling • Family planning	• Parenting skills • Communication skills • Conflict resolution • Developing a support network	• Child care during treatment • Transportation • Housing Literacy	• Depression and anxiety • Sexual abuse • Sexuality • Issues of loss • Self-esteem	• Interview and job-skills training • Employment • Maintaining a job • Money management

Researchers reviewed by Jones et al. (1999, 256) have also identified other considerations in providing treatment for women, including the need for outreach efforts that involve community based workers and organizations, and provide transportation; women-only groups to address issues such as self-esteem, anxiety, depression, sexuality, communications skills and personal health; screening for family violence; HIV intervention; and vocational training and skills development (Jones, et al. 1999, 256).

Gilbert, El-Bassel, Rajah, Foleno, Fontdevila, Frye and Richmand (2000, 461) have called for a better understanding of how partner violence contributes to HIV and HCV risk and drug use in order to develop more effective interventions for the problems experienced by women who are dependent on opioids. Based on the results of their study, they recommend the following:

- "routine screening for partner violence during intake and annual physical exams"
- provision of "concrete services (e.g. housing, job training and placement, and securing benefits) and enhancing the social support networks to increase financial and emotional independence of abused women from their partners"
- "addressing underlying trauma and related stress that many abused, drug-involved women present"
- raising awareness of the multiple ways in which drug-related activities increase the risk of partner violence.

Gilbert el al. (2000, 462) suggest that methadone maintenance treatment may be an "ideal setting" for implementing HIV, HCV and drug relapse intervention programs which are targeted to the specific context of abused, drug-involved women.

7.3 MMT and Pregnant Women

Pregnant women who are dependent on opioids are at high risk for many different medical complications. A review by Jones, et al. (1999, 260) provides a valuable overview of these issues (See Table 10)

Table 10
Obstetric Problems Associated with Opioid Use
(based on Jones et al., 1999, 260)

• Spontaneous abortion	• Gestational diabetes
• Intrauterine death	• Postpartum haemorrhage
• Abruptio placentae	• Eclampsia
• Amnionitis	• Increased hospitalization
• Chorioamnionitis	• Preeclampsia
• Septic thrombophlebitis	• Stillbirth
• Placental insufficiency	• Intrauterine growth retardation
• Premature rupture of membranes	• Premature labour

The extent to which these problems result directly from drug use, or from the poor nutrition, high-risk lifestyle and lack of prenatal care experienced by pregnant women who are dependent on opioids is not clear. (Robins & Mills, as cited in Jones et al., 1999, 256-257) In addition, Jones et al. (1999, 257) point out that drug-related complications vary depending on: drug(s) used; stage of pregnancy when drugs were used; route of drug administration; withdrawal, or cycles of intoxification and withdrawal; lack of prenatal care; and failure to diagnose and treat drug-related problems.

Since the 1970s, methadone maintenance has been the "treatment of choice" for the opioid-dependent pregnant woman (Finnegan; Finnegan; Kaltenbach et al., as cited in Ward et al., 1998d, 397). Kandall, Doberczak, Jantunen and Stein (1999, 180) conclude that: "General agreement exists that pregnancy offers a unique opportunity to bring women into medical, obstetric, and drug treatment." Ward et al. (1998d, 413) summarize the benefits of providing methadone maintenance treatment which have been demonstrated in the research, including:

- providing a pharmaceutical grade opioid under medical supervision rather than using an illicit opioid of "unknown quality and uncertain supply"
- avoiding the "peaks and troughs" in blood levels when a shorter-acting opioid such as heroin is used
- avoiding exposure to contaminants including those that may be teratogenic; and
- creating an opportunity to provide adequate antenatal care.

Ward et al. (1998d, 413) also conclude, based on their review of the evidence, that compared to women not in treatment, providing methadone maintenance treatment results in increased likelihood of carrying pregnancy to term; fewer birth complications; and larger infants (for their gestational age).

Like other women who are dependent on opioids, pregnant opioid-dependent women may experience significant barriers to accessing treatment (see Section 7.2). In addition, Ward et al. (1998d, 413) note that the research indicates that women who are pregnant may also experience conditions that are not conducive to a successful pregnancy, such as inadequate nutrition and rest; inadequate antenatal care, including poor access to obstetrical care; and exposure of themselves and their fetuses to fluctuating blood levels of heroin, unknown drugs and contaminants and infections with HIV, HCV and other blood-borne pathogens associated with injection drug use.

Other barriers to care include fear of involvement with the criminal justice system; fear that their children will be removed from their care; lack of transportation; lack of child care for other children; lack of access to obstetrical care; social stigma/attitudes of medical personnel; and lack of women's treatment services (Janson et al., as cited in Jones et al, 1999, 259).

Ward et al.(1998d, 398) suggest that the key clinical issues in providing methadone maintenance treatment for pregnant women who are dependent on opioids include selecting an appropriate dose; providing appropriate antenatal care; making counselling available during treatment; and managing the abstinence syndrome in the neonate.

Based on their review of the literature, Jones et al., (1999, 259-260) note that providing comprehensive care can improve pregnancy outcomes. A comprehensive approach to treatment which addresses the unique needs of pregnant women who are opioid dependent includes:

- primary medical care to address the range of problems related to opioid dependence including tuberculosis
- treatment and management of infection (with HIV, HCV or other blood-borne pathogens) for mothers, and possibly for infants
- intensive perinatal management for high-risk pregnancy
- psycho social counselling (including nutrition, parenting and money management education; social services advocacy for assistance with unstable living conditions, unemployment, and literacy)
- prenatal/parenting education classes
- mental health assessment and therapy, and
- methadone maintenance.

Based on their review, Ward et al. (1998d, 414) also suggest the following:

- women-only group sessions which also function as antenatal and parenting classes, and which address other relevant issues for opioid-dependent women
- non-judgmental antenatal care including special clinic times, access to analgesia or anaesthesia during labour or birth
- proper assessment of the severity of the neonatal abstinence syndrome using specially designed instruments

- provision of morphine, phenobarbital or paregoric, as needed, and
- encouragement of breastfeeding by mothers receiving methadone maintenance treatment.

Careful monitoring and adjustment of methadone dose and regimen is required throughout the pregnancy, especially during the third trimester, when the metabolism of methadone increases (Kreek, Schecter and Gutjar; Kreek; Pond et al; Gazaway, Bigelow and Brooner, as cited in Jones et al., 1999, 262). If unexpected withdrawal symptoms develop during this period, increased or split doses may be required (Ward et al., 1998d, 414). Jones et al. (1999, 272) conclude that detoxification from methadone during pregnancy is not recommended, except under "the most dire circumstances." According to Ward et al.'s summary (1998d, 413): "Few...women...can achieve total abstinence without relapse or obstetrical complications intervening. Therefore, the treatment of choice for most opioid dependent women is methadone maintenance throughout their pregnancy." In their review, Kaltenbach, Berghella and Finnegan (1998, 147-148), point out that, although prenatal exposure to heroin or methadone often results in neonatal abstinence syndrome, this syndrome can be treated with pharmacotherapy without negative effects. They conclude that: "There is no compelling evidence to reduce maternal methadone dose to avoid neonatal abstinence."

Comprehensive methadone maintenance treatment is widely considered the standard of care for pregnant women who are dependent on opioids. The benefits – compared to heroin use – include better prenatal care; increased fetal growth; reduced fetal mortality; decreased risk of HIV infection; decreased cases of preeclampsia and neonatal withdrawal; increased likelihood that infant will be discharged to his or her parents; and increased retention in treatment (Kandall et al., Finnegan; Svikis et al., as cited in Jones et al., 1999, 258).

Jones et al. (1999, 272) conclude that: "Overall it appears that when the physical, psychologic, and economic issues of the pregnant opioid abuser are addressed concurrently with methadone treatment, the benefits far outweigh the risks for the mother, the fetus and the infant."

7.4 MMT and Comorbid Medical Conditions

According to Lowinson, et al.(1997, 409), people who are dependent on opioids often experience chronic illnesses including: chronic hypertension; diabetes; chronic liver disease and cirrhosis; asthma; tuberculosis; syphilis; endocarditis; and other infectious diseases. In his comprehensive chapter on the medical needs of people receiving methadone maintenance treatment, Fingerhood (1999,

118-136) describes a wide variety of comorbid medical conditions commonly experienced by people receiving methadone maintenance treatment (see Table 11).

Table 11
[Common Medical Disorders Among People Receiving Methadone Maintenance Treatment (based on Fingerhood, 1999, 118-136)]

Skin and soft tissue infections from non-sterile injection techniques: infections caused by staphylococcus aureus, clostridium, aspergillus, streptococci, Gram-negative rods; infections caused by soft tissue injections; thrombus; complications from injection drugs include cellulitis, abscess, septic thrombophlebitis, pyomyositis, and pseudoaneurysms; osteomyelitis or septic arthritis from bacteremia; lymphatic obstruction and edema from chronic skin popping; foreign body reactions from subcutaneously lodged or migrated needle fragments.

Cardiac complications: endocarditis; cardiac complications linked to cocaine use (mycocardial infarction, coronary artery spasm with angina, and cardiomyopathy).

Sexually transmitted diseases: chlamydia, gonorrhea, genital herpes, HIV, syphilis, human papilloma virus related to cervical cancer.

Hepatitis: alcohol-induced liver damage; viral hepatitis (B, C and D); cirrhosis.

Pulmonary Complications: pulmonary complications related to HIV including pneumocystis carinii pneumonia and others; pulmonary complications related to frequent bacterial pneumonias (often linked to smoking); aspiration pneumonia due to alcohol use or overdosing; secondary lung infections resulting from septic emboli from endocarditis or thrombophlebitis (septic emboli may cause an abscess, an empyema, or a pulmonary infarction); tuberculosis.

Non-infectious pulmonary disease: (pulmonary edema due to heroin overdose, chronic lung disease, pulmonary hypertension due to hypoxia); bronchospasm; atelectasis, alveolar haemorrhage, pulmonary infarction and bronchiolitis obliterans due to smoking freebase cocaine; pneumothorax.

Renal complications: kidney failure (heroin nephropathy); renal amyloidoisis; acute renal diseases (myoglobinuria and glomerulonephritis related to endocarditis or hepatitis B or C infection); membranous, membranoproliferative and minimal change renal diseases.

Neurologic complications: delirium and hallucinations related to alcohol or contaminated heroin or cocaine, or benzodiazepine use; seizures related to overdoses, cocaine-induced vasospasm, abscess, HIV-related infection, embolic or thrombotic stroke, meningitis, subdural hematoma, and alcohol withdrawal; traumatic and atraumatic mononeuropathies; Bell's palsy; infectious neurologic complications (meningitis, brain abscess, subdural and epidural abscesses, mycotic aneurysms).

Immunologic abnormalities: hypergammaglobulinemia; thrombocytopenic purpura.

Physical trauma or non-specific issues such as fatigue, insomnia, difficulty concentrating, related to domestic violence experiences.

Septal perforation.

Potential side effects of methadone: sweating, constipation, menstrual abnormalities, lymphocytosis, increased prolactin levels.

Based on his review, Fingerhood (1999, 135) concludes that, despite the frequency of comorbid medical conditions among clients/patients in methadone maintenance treatment, these individuals often receive inadequate medical care. Methadone maintenance treatment represents a key opportunity to provide this much-needed care, and doing so could decrease morbidity, mortality and long-term health care costs. Lowinson et al. (1997, 410) notes that: "...providing primary care to substance abusers treated in methadone maintenance clinics could reduce demand placed on emergency rooms and the need for hospitalizations and thereby drastically cut the overall cost of their care."

According to Leshner (1999): "[drug] treatment programs should...provide repeated assessments for HIV and acquired immunodeficiency syndrome, hepatitis B and C, tuberculosis, and other infectious diseases, as well as noninfectious diseases like diabetes mellitus and hypertension, in addition to counseling and referral for relevant medical treatment."

Fingerhood (1999, 135-136) points out that some aspects of medical care for people receiving MMT are unique. For example, many clients's/patients' medical conditions are related to drug use, and the potential for medications to interact with methadone is an important consideration. At the same time, many other aspects of medical care will not be different, such as the need for responsive, knowledgeable staff, and the need for a setting that promotes caring and trust.

According to a report by Salsitz et al. (2000, 394), physicians working in a methadone medical maintenance (MMM) program in the U.S.[19] were well-positioned to play an important role in providing a range of health interventions. They were able to either treat or refer clients/patients to specialists for a wide range of acute and chronic illnesses. These physicians also played, with the permission of their clients/patients, an important role as ombudsmen, i.e., "contacting and working with other specialists, informing them about methadone maintenance, its overall safety, the need for adequate pain management, and the applicability of continued MMM for the patients."

7.5 MMT and Prevention and Treatment of Hepatitis C

Among individuals who inject drugs, the rate of infection with the hepatitis C virus (HCV) is very high – international estimates range from 50% to 100% (Finch, as cited in Health Canada, 2000a, 1). The primary transmission route is exposure to blood and blood products. Individuals who share needles and other drug paraphernalia are at high risk of infection[20]. In Canada, 70% of all prevalent

19 The Methadone Medical Maintenance (MMM) was started in 1983 in New York City to allow some methadone clients/patients to be treated by private physicians rather than in traditional methadone clinics. (Salsitz, et al., 2000, 388).

HCV infections are related to injection drug use (Laboratory Centre for Disease Control (LCDC), as cited in Health Canada, 2000a,6). Almost all MMT clients/patients have injected drugs (Novick, 2000, 437), and hepatitis C infection among clients/patients receiving MMT is now recognized as a major health problem (Novick, Hagan & Des Jarlais; Salsitz et al., as cited in Joseph et al., 2000, 359)

Researchers in the U.S. have found that hepatitis C is the most prevalent serious health problem among clients/patients receiving MMT: for example, 92% of clients/patients enrolled in a methadone medical maintenance (MMM) program in the U.S. tested positive for hepatitis C virus-RNA (HCV-RNA). In this study, complications related to hepatitis C were the second highest cause of death among these clients/patients, after smoking related diseases (Salsitz et al., 2000, 394). According to studies reviewed by Novick (2000, 438), the seroprevalence of hepatitis C virus in methadone clients/patients ranges from 67-84%. These high seroprevalence rates are related to: the high prevalence of HCV among injection drug users; the extreme infectiousness[21] of HCV; the likelihood that clients/patients may be infected with HCV when they enter MMT; the fact that individuals can become infected after only a few injections; gaps in MMT treatment histories or injection of drugs during MMT (Crofts et al., as cited in Novick, 2000, 438); inadequate methadone dose (Dole; Bell, Chan & Kuk; Strain et al., as cited in Novick, 2000, 238); and cocaine injecting (Thomas, et al.; Novick et al., as cited in Novick, 2000, 238).

7.5.1 MMT and Prevention of Hepatitis C

According to Novick (2000, 440) for those individuals who have injected drugs but have not yet acquired the hepatitis C virus, entry into methadone maintenance treatment – combined with no further drug or alcohol use – is likely to prevent infection with hepatitis C. However, MMT's overall effectiveness as a tool in primary prevention may be rather limited, given the high seroprevalence of hepatitis C virus among MMT clients/patients.

MMT is, however, an opportunity for secondary prevention. Engaging people who are hepatitis C positive in MMT creates an opportunity to provide them with education to prevent the further transmission of the

20 Even a tiny or invisible amount of blood residue in a syringe and needle can contaminate this equipment. Such residue is also likely to contaminate other items such as drug cookers and filtration cotton (Hagan & Des Jarlais, 2000, 423, 425).

21 HCV is 10 to 15 times more infectious through blood contact than HIV (Heintges & Wands, as cited in Health Canada-a, 2000, 1)

hepatitis C virus[22]. HCV prevention is a specific and emerging field in Canada. There is increasing recognition that, as a result of a number of factors including differences in the dynamics of transmission, measures to prevent and control HCV transmission among people who are dependent on opioids may pose an even greater challenge than prevention and control of HIV transmission (Hagan & Des Jarlais, 2000, 426).

7.5.2 MMT and Treatment for Hepatitis C

MMT is a key opportunity for clients/patients who have untreated infection with hepatitis C to more easily access appropriate medical treatment (Joseph et al., 2000, 361).

High numbers of clients/patients receiving methadone maintenance treatment will be at various stages of hepatitis C infection (Novick, 2000, 441). Methadone is not necessarily contraindicated for people who are

HCV-positive (Canadian Association for Study of the Liver, 2000, 14B): an individual with stable chronic liver disease can safely continue to receive methadone maintenance treatment for many years (Novick, 2000, 440), although caution must be exercised in some specific circumstances[23]. Generally speaking, MMT programs should be prepared to identify, evaluate, monitor and consider various treatment options for clients/patients who are HCV-positive and who would benefit from treatment. For example, vaccination against hepatitis A may help prevent HCV-positive clients/patients acquiring an additional infection that could increase the risk of hepatic failure and death (Vento et al., as cited in Novick, 2000, 443).

Providers should also recognize that treatment of hepatitis C is evolving. There are many – often complex – issues in providing care, treatment and support for individuals who are hepatitis C positive. For example:

22 Some evidence suggests that peer driven intervention – which involves individuals who inject drugs in delivering prevention information to others who inject drugs or who are contemplating injecting drugs – may be an effective strategy to prevent new HCV infections, particularly among young people, who have not yet started injecting or have not been injecting for very long (Health Canada, 2000b, 8-9). This idea, however, should be approached with some caution since MMT clients/patients may want to change their lifestyle and move away from drug using networks and contacts.

23 For more information on the prescribing of methadone for clients/patients who are HCV-positive, readers are encouraged to consult the references cited in this section.

- overall, the effectiveness of current treatments is 40% (with a range of 30-65%, depending on the genotype (Canadian Association for the Study of the Liver, 2000,13B)

- there can be numerous side effects from treatment

- based on current recommendations, some clients/patients may experience conditions which make them less likely to be given treatment for HCV infection. For example, there may be clinical requirements to not provide treatment to anyone who is not abstinent from all substances (and particularly alcohol), or who has a major psychosis (Novick, 2000, 440-441; Sherman & McSherry, 1999, Q7).

- the management of co-infection with HCV and HIV is an emerging area (it is expected that forthcoming guidelines will provide further information in this area)

- access to drug coverage for hepatitis C therapies varies across Canada

- current combination treatment with interferon and ribavarin requires that clients/patients self-administer thrice-weekly injections, although new therapies may reduce this requirement to one injection per week.

Providers should be aware that there are promising new treatments which are expected to become available in the near future.

7.6 MMT and Prevention and Treatment of HIV

Methadone maintenance treatment programs offer a critical opportunity to provide disease prevention and education – including screening and counselling for transmissible diseases, and information on safe sex, the risks involved in needle sharing, and how to clean syringes(Canadian HIV-AIDS Legal Network, 1999, 58). Specific interventions could be targeted to prevention of STDs, while others could be targeted to prevention of HIV, HCV and other blood-borne pathogens. According to Leshner (1999), "Counseling on the risks of disease transmission can be effective in helping patients modify or change behaviors that place themselves or others at risk of infection." In addition, MMT is also an opportunity to provide appropriate medical care for people who are dependent on opioids and who have acquired HIV, HCV or other blood-borne pathogens (see also Section 7.5).

7.6.1 MMT and Prevention of HIV

Methadone maintenance treatment has become an important tool in reducing the transmission of HIV among injection drug users, primarily because it decreases injection drug use. According to Zweben and Pate (as cited in Canadian HIV-AIDS Legal Network, 1999, 58), methadone maintenance treatment has become a "critical resource in the struggle against injection drug use and AIDS." Effective linkages between needle exchange programs and methadone maintenance treatment programs can help maximize the benefits: "When injection drug users enter treatment programs on the recommendation of needle exchange program (NEP) staff, the number of individuals in a community who require medical care is reduced; this has an impact on drug-related morbidity" (Loue et al., as cited in Canadian HIV-AIDS Legal Network, 1999, 90).

Broers, Junet, Bourquin, Déglon, Perrin and Hirschel et al. (1998, 2059) found that prevention measures targeting drug users in Geneva – including increased access to methadone maintenance treatment – may be linked to changes in risk-taking behaviours among drug users, such as a shift away from injecting drugs to smoking or inhaling and the adoption of safer injecting behaviour. Based on a study of HIV infection in New York over a ten year period, Hartel and Schoenbaum (1998, 114) found "strong protective associations against HIV infection for high dose methadone treatment and early entry into and continuous stay in methadone treatment, independent of cocaine injecting, shooting gallery injecting, and sex with other IDUs."

7.6.2 MMT and HIV Treatment

Although methadone maintenance treatment has been shown to reduce the transmission of HIV – primarily by reducing drug injecting – people entering treatment may already be HIV-positive, or they may become HIV-positive during treatment if they or their partners continue to engage in high risk behaviours. Fingerhood (1999,118) points out that the "AIDS epidemic" means many people will need "lifetime medical care and associated support services." Fingerhood (1999, 124) also notes that there are specific issues in caring for people who are HIV-positive and receiving methadone maintenance treatment. Some of these considerations include:

- morbidity related to injection-drug use (endocarditis, abscesses and viral hepatitis)

- higher rates of bacterial pneumonia and tuberculosis
- need for compliance with drug regimen to avoid the development of viral resistance
- need for practitioners to be well-versed in providing HIV care and knowledgeable about up-to-date therapies.

Based on their detailed review of interactions between methadone and medications used to treat HIV infection, Gourevitch and Friedland (2000, 435) conclude that: "Clinicians must be informed of those interactions documented thus far, and remain alert to the possibility that other interactions, which are still undocumented may be present among their patients."

7.7 MMT and Mental Health Disorders

7.7.1 Prevalence

In their review of the assessment and treatment of comorbid psychiatric disorders among clients/patients receiving methadone maintenance treatment, King and Brooner (1999, 140-143) note that, although studies differ and can be difficult to compare, there is a great deal of evidence that indicates that people who are dependent on opioids experience high rates of mental health disorders compared to the general population. Their description of the prevalence of mental health disorders is summarized in Table 12. Please note: information about whether or not studies included both men and women was not provided.

Table 12
(based on King & Brooner, 1999, 144-146)

Prevalence of Mood Disorders

- major depression (lifetime): 15.8% - 53.9%
- major depression (current): 0% - 26.3% (lower rates may be due to length of stabilization in treatment, inclusion of people not receiving treatment, and absence of standard time frame for evaluation)
- bipolar disorder(lifetime and current): 1% (same as general population)
- dysthymic disorder: 3%-15%

Prevalence of Anxiety Disorders

- phobias (lifetime): 2.3%-9.6%
- phobias (current): as high as 9.2%
- generalized anxiety disorder (GAD) (lifetime): as high as 5.4%
- GAD (current): 1%
- panic disorder (lifetime): as high as 2%
- panic disorder (current): less than 1%
- obsessive-compulsive disorder(lifetime): less than 2% (relatively rare)
- obsessive-compulsive disorder (current): 1% or less (relatively rare)

Prevalence of Personality Disorders

- overall rate of personality disorders is high: 34.8% - 68%
- antisocial personality disorder (APD):14.5% to 54.7% (most common personality disorder)[24]
- borderline personality disorder: 3.7%-12.1%
- avoidant disorder: 5%
- passive-aggressive disorder: 4%
- paranoid disorder: 3%

Prevalence of Other Mental health Disorders

- schizophrenia: 1-2% (relatively rare)
- eating disorders (lifetime): greater than 1% in women (current diagnosis is rare)
- posttraumatic stress disorder (lifetime): 8.3% for cocaine/opiate users (significant problem)
- attention-deficit hyperactivity disorder (ADHD): one-fifth have history of ADHD; 12% have current symptoms.

24 Darke, Kaye and Finlay-Jones (1998, 67) have found that antisocial personality disorder is over diagnosed among injection drug users. Darke, Hall and Swift (1994, 256) suggests that high rates of ASPD diagnosis may be inflated due to diagnostic criteria which overlap with many behaviours common to those who use illicit substances.

7.7. 2 Gender Differences

In their review of psychiatric comorbidity among individuals who are dependent on opioids, Ward et al.(1998f, 432) cite evidence that suggests the differences in the prevalence of mental health disorders among men and women that are found in the general population are also found in the population of individuals who are dependent on opioids. For example, women who are opioid dependent experience more anxiety disorders and depressive disorders than men who are dependent on opioids. Men are more likely to be diagnosed with, for example, antisocial personality disorders. In terms of global measures of psychopathology[25], women who are dependent on opioids appear to have much higher levels.

7.7.3 Associated Risks

King and Brooner (1999, 162) cite research that has found individuals with comorbid mental health disorders have higher rates of drug use while in treatment; continued drug use after treatment; and other substance use behaviours. Other researchers have found a relationship between mental health disorders among people who are dependent on opioids and increased risk behaviours such as needle sharing and rates of HIV infection (Brooner et al.; Brooner et al.; Gillet al., as cited in Abbott et al., 1998, 35.)

Although identifying comorbid mental health disorders can be challenging, it can be very helpful in identifying clients/patients who are likely to require additional help — including treatment for their comorbid mental health disorders and other resources — to improve their methadone maintenance treatment outcomes (King & Brooner, 1999, 152).

7.7.4 Screening, Assessment and Diagnosis

King and Brooner (1999, 146) suggest that standardized instruments can be used to screen, assess or diagnose mental health disorders in people who are dependent on opioids. Self-completed questionnaires, such as the Beck Depression Inventory or the Symptom Checklist 90-R(SCL-90-R), can be used as screening tools. Interview instruments, such as the Addiction Severity Index (ASI), the Structured Clinical Interview for DSM-IV(SCID), or the Diagnostic Interview Schedule (DIS) can be used to assess and/or diagnose mental health disorders.

25 As measured by surveys using the General Health Questionnaire.

King and Brooner (1999, 148) also note that clinical evaluation without the use of these tools is still possible, but should be based on standardized diagnostic criteria such as those contained in the DSM-IV. Clinical evaluation should take into account the most common mental health problems found in this population, i.e., major depression, dysthymic disorder, APD and other personality disorders, anxiety disorders, ADHD, as well as other substance use disorders.

According to King and Brooner (1999, 150-151) a challenging aspect of diagnosing comorbid mental health disorders is making a distinction between symptoms that are substance-induced and those that are evidence of an independent mental health disorder. This requires information about increases or decreases in drug use and the impact on symptoms; the presence or absence of symptoms during periods of drug abstinence; and the presence of other medical disorders or medical treatments that may produce similar symptoms

They emphasize that: "It is vital to rule out medical or substance-induced mood changes and to treat any independent mental health disorder in order to improve a patient's ability to engage in drug abuse treatment via counselling, medication treatments, and medical management." In a study by Brooner et al. (as cited in King & Brooner, 1999, 154), 77% of those seeking treatment for opioid dependence who met the criteria for lifetime major depression had a substance induced rather than an independent disorder. The use of methadone, marijuana, caffeine, nicotine, alcohol, cocaine, benzodiazepines and other sedatives/hypnotics can present as depression or interfere with the management of depressive or manic symptoms.

7.7.5 Treatment

Delivering methadone maintenance treatment programs to people who are dependent on opioids and who also have mental health disorders is a challenging reality of service provision, given the prevalence of mental health disorders among people receiving methadone maintenance treatment (Ward et al., 1998f, 435). Methadone maintenance treatment programs which are part of a comprehensive service model can be an important link in the provision of mental health treatment services, by providing access to: a stable environment (daily attendance, clear rules, etc.); dispensing of medication for mental health disorders alongside doses of methadone; referrals to mental health or medical evaluations; adequate medical care; linkages with outside health care providers; psychotherapy or counselling; work-related activity; and mental health psycho social rehabilitation programs.

7.8 MMT in Correctional Settings

In Canada, the transmission of HIV, HCV and other blood-borne pathogens in correctional facilities is a pressing concern. Between 1994 and 1995, the number of cases of HIV/AIDS rose by 40% in a little more than one year. The rates of hepatitis C among incarcerated populations range from 28-40% (Canadian Centre on Substance Abuse & Canadian Public Health Association, 1997, 8). Estimates of HIV prevalence among incarcerated offenders range from 1-4 percent among men, and 1-10 percent among women. HIV infection among both incarcerated men and women is strongly associated with a history of injection drug use (Rothon et al.; Calzavara et al.; Hankins et al.; Hankins et al.; Dufour et al., as cited in Health Canada, 1999b, 3). Based on their research, Rothon, Mathias and Schechter (1994, 785) note that the higher rates of HIV infection among women offenders was due to a greater proportion of women reporting a history of injection drug use – an association that is "likely due to a much closer relation between drug use, prostitution and incarceration among women than among men."

Rothon, Strathdee, Cook and Cornelisse (1997, 16) found an HIV prevalence rate of 0.25% among young offenders in British Columbia. According to Rothon et al.: "Despite low HIV prevalence, our study revealed that patterns of risk behaviour such as IDU, sex for trade and sex with injection drug users are already established among incarcerated youth. It is of particular concern that IDU as equally prevalent among younger youth aged 12 to 15 compared to 16 to 19 year olds."

According to a 1997 national report on HIV, AIDS and injection drug use in Canada, many injection drug users spend time in correctional facilities as the result of either convictions for drug offences, or other convictions related to their drug use. According to this report published by the Canadian HIV/AIDS Legal Network & Canadian AIDS Society (1996, 71), there is "abundant evidence that injecting drug users are over-represented in the prison population."

In recent years, many national and international organizations have recommended providing methadone maintenance treatment programs in correctional facilities as a key strategy to reduce the transmission of HIV, HCV and other blood-borne pathogens. These recommendations are based on the evidence that MMT is effective in reducing mortality, heroin consumption, high-risk injecting behaviour (and needle-sharing), criminality, and in retaining people in treatment.

Australian researchers conducted an evaluation of Prison Methadone Maintenance Treatment (PMMT) in Australia in which they noted that, as in community settings, MMT has the same potential to reduce injection and needle sharing in prison settings. However, they also note the need to provide adequate doses of methadone – and to provide methadone for the duration of incarceration – in order to realize these benefits (Dolan et al., as cited in Canadian HIV/AIDS Legal Network & Canadian AIDS Society, 1996, 72). These researchers concluded that: "MMT has an important role to reduce the spread of HIV and hepatitis in prison."

In addition, according to Dolan, Hall and Wodak (1998, 380), "The concentration of IDUs among inmate populations suggest that provision of drug treatment within prison might be more cost-effective than in the community."

According to an information and resource package on methadone maintenance treatment produced by Correctional Service Canada (Correctional Service Canada, 1998) and based on experiences in correctional systems in other jurisdictions, providing methadone maintenance treatment contributes to:

- Reduced injecting and needle sharing in prison;
- Decreased drug-related prison violence;
- Decreased crime after release from prison;
- Reduced staff anxiety with regard to HIV transmission;
- Improved management of inmates.

The National Task Force on HIV, AIDS and Injection Drug Use (Canadian Centre on Substance Abuse & Canadian Public Health Association, 1997, 15) recommended the following actions:

- Allow offenders who have been in a methadone maintenance program prior to incarceration to continue to receive such treatment while incarcerated.
- Ensure methadone treatment is available to opioid-dependent offenders who were not receiving it prior to incarceration.
- Evaluate the need for methadone maintenance therapy prior to release into the community, and ensure priority transfer to community programming at release.

In its report, the Canadian HIV/AIDS Legal Network (1999, 90) recommended that correctional systems should ensure that offenders who were in a methadone maintenance program prior to incarceration are able to continue methadone maintenance treatment while incarcerated, and that those who are able to start such treatment while incarcerated can do so whenever they would have been eligible for it outside.

According to their summary, Dolan et al. (1998, 382, 390-391), suggest that there are a number of different points at which methadone should be provided to inmates including:

- *Entry into the correctional facility*. Since so many IDUs are incarcerated, opioid withdrawal is very common. Methadone can be used to treat opioid withdrawal.

- *During incarceration*. There are much higher rates of injection-related risk behaviours in prison, and methadone maintenance probably helps reduce the transmission of HIV (although documented evidence of HIV transmission is difficult to obtain). Other prevention strategies such as syringe exchange and bleach programs are either not commonly available in prison settings or are not particularly effective (Dolan et al., 1998, 383-384, 389). Programs are needed for IDUs who enter prison as well as those who begin injecting drugs while in prison.

- *Pre-release*. Providing methadone to IDUs nearing release can increase tolerance and reduce risk of overdose, reduce illegal activity after release, and reduce likelihood of reincarceration (Dolan et al., 1998, 382).

Part 8: Research and Evaluation

According to Bell (1998a, 161) there is a great disparity between research and practice in methadone maintenance treatment, and the major factor in this disparity is "profound disagreement over such basic issues as the nature of the problem being treated and the goals of treatment." Bell (1998a, 162) emphasizes the need for research and treatment to share a common "frame of reference" for making observations, generating hypotheses, and evaluating clinical practices. The lack of such a frame explains "why, despite extensive research validation, methadone maintenance continues to be referred to as 'controversial."

There are many important reasons for conducting more research on methadone maintenance treatment. For example, making methadone maintenance more client/patient-centred, and conducting research on outcomes that are priorities for clients/patients are key areas (Hall et al., 1998a, 3-4). Making substance use treatment "more attractive and acceptable to the general public, as well as to decision makers and funding agencies" (Stoller & Bigelow, 1999, 33) by evaluating the cost-effectiveness and benefits of treatment is an another important area of study.

Numerous research gaps were identified in the literature reviewed for this report. Examples include the need to assess methadone maintenance treatment's impact on the "containment" of HIV transmission, an area which has been "less investigated" than other outcomes such as the impact on illicit drug use, injection drug use and criminal acts (Hall and Mattick, 1998a, 3); and the need to determine methadone maintenance treatment's impact on improving the health and social well-being of people who are dependent on opioids (Hall, 1998a, 4). Relatively few studies have examined the extent to which methadone maintenance treatment plays a role in the prevention of hepatitis B and C (Ward et al., 1998g, 60) and this is another area where research is needed.

There is a valuable, but limited, body of research on delivering MMT programs to specific populations with diverse needs. In particular, more research is needed on effective strategies to address the needs of those who use multiple substances, women, pregnant women, people suffering from comorbid medical conditions (including those who have acquired HIV, HCV or other blood-borne pathogens) and/or mental health disorders. Implementing and evaluating the effectiveness of MMT delivery strategies within correctional settings remains another challenge.

Further investigation into economic aspects of MMT would also be valuable. For example, Ward and Sutton (1998, 92) suggest that: "Economic evaluations that look at both the cost and the consequences of intervening will prove to be more valuable in persuading those charged with the responsibility of determining the appropriate allocation of resources of the value of methadone maintenance treatment." They also note that cost-of-illness studies do not indicate whether or not there are interventions that can cost-effectively reduce the burden of illness identified (Ward and Sutton, 1998, 95). The National Consensus Development Panel on Effective Medical Treatment of Opiate Addiction, (1998, 1941) identified the need for further study of the economic costs of opioid dependence and the cost-effectiveness of methadone maintenance therapy.

Part 9: Conclusions

The overall effectiveness of methadone maintenance treatment is established in the literature. There is clear evidence that methadone maintenance treatment offers a range of benefits which far outweigh the costs of delivering treatment.

Research has identified specific program-related factors that are likely to improve the effectiveness of methadone maintenance treatment programs. In particular, treatment programs that focus on retaining individuals in treatment are those most likely to enhance the likelihood of achieving positive outcomes. This includes programs that adopt a client/patient-centred approach and that employ a comprehensive service model which addresses the multiple needs of individuals who are dependent on opioids. Other important factors — such as admission criteria, assessment, adequate individualized dosage, unlimited duration of treatment, therapeutic monitoring of drug use during treatment, and a client/patient-centred approach to tapering — also play a role in improving retention and treatment outcomes. Staff training and program environments are critical areas that contribute to the therapeutic process and the achievement of positive treatment outcomes.

In conclusion, there are good, evidence-based reasons to focus on improving access to effective MMT treatment. Ongoing research and evaluation that compares the effectiveness of various program modalities, and delineates the range of access points, settings, and delivery modes will be important to further improve outcomes.

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